MZ-E90

SERVICE MANUAL

E Model
Tourist Model

Ver 1.0 1999. 11

(Photo: Silver)

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Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MT-MZE90-166
Optical Pick-up Mechanism Type	LCX-2E

SPECIFICATIONS

System

Audio playing system
MiniDisc digital audio system

Laser diode properties
Material: GaAlAs
Wavelength: λ = 790 nm
Emission duration: continuous
Laser output: less than 44.6 μW
(This output is the value measured at a distance of 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.)

Revolutions
600 rpm to 2250 rpm

Error correction
Advanced Cross Interleave Reed Solomon Code (ACIRC)

Sampling frequency
44.1 kHz

Coding
Adaptive TRansform Acoustic Coding (ATRAC)

Modulation system
EFM (Eight to Fourteen Modulation)

Number of channels
2 stereo channels
1 monaural channel

Frequency response
20 to 20,000 Hz ± 3 dB

Wow and Flutter
Below measurable limit

Outputs
Headphones: stereo mini-jack,
maximum output level 5 mW + 5 mW, load impedance 16 ohm

General

Power requirements
Nickel metal hydride rechargeable battery NH-14WM (supplied)
One LR6 (size AA) battery (not supplied)
Sony AC Power Adaptor AC-E15L* (not supplied) connected to the DC IN 1.5V jack

Battery operation time
Battery life*

Batteries	Playback
Ni-MH rechargeable battery (NH-14WM)	Approx. 21 hours**
One LR6 (size AA) alkaline battery	Approx. 31 hours
One LR6 (size AA) alkaline battery and a Ni-MH rechargeable battery (NH-14WM)	Approx. 56 hours**

* The battery life may be shorter depending on operating conditions and the temperature of the location.
** With a fully charged battery

– Continued on next page –

PORTABLE MINIDISC PLAYER

MICROFILM

SONY

Dimensions
Approx. 78.4 × 13.5 × 71.5 mm (w/h/d)
(3 1/8 × 9/16 × 2 7/8 in.) not including projecting parts and controls
Mass
Approx. 70 g (2.5 oz.) the player only
Approx. 113 g (4.0 oz.) incl. a premastered MD and a nickel metal hydride rechargeable battery NH-14WM
Supplied accessories
Battery Charger (1)
Rechargeable battery (1)
Rechargeable battery carrying case (1)
Headphones with a remote control (1)
Dry battery case (1)
Carrying pouch (1)
AC Plug Adaptor (1) (World model only)

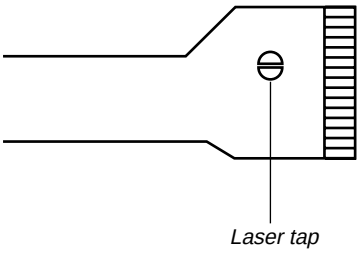
Design and specifications are subject to change without notice.

Precautions for Laser Diode Emission Check

When checking the emission of the laser diode during adjustments, never view directly downwards as this may lead to blindness.

Precautions for Using Optical Pick-up (LCX-2E)

As the laser diode inside the optical pick-up damages by static electricity easily, solder the laser tap of the Optical pick-up flexible board when handling. Also take the necessary measures to prevent damages by static electricity. Handle the Optical pick-up flexible board with care as it breaks easily.



Optical Pick-up flexible board

SAFETY-RELATED COMPONENT WARNING!!

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION.
REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

This MiniDisc player is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT label is located on the bottom exterior.

IN NO EVENT SHALL SELLER BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE, OR LOSSES OR EXPENSES RESULTING FROM ANY DEFECTIVE PRODUCT OR THE USE OF ANY PRODUCT.

“MD WALKMAN” is a trademark of Sony Corporation.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

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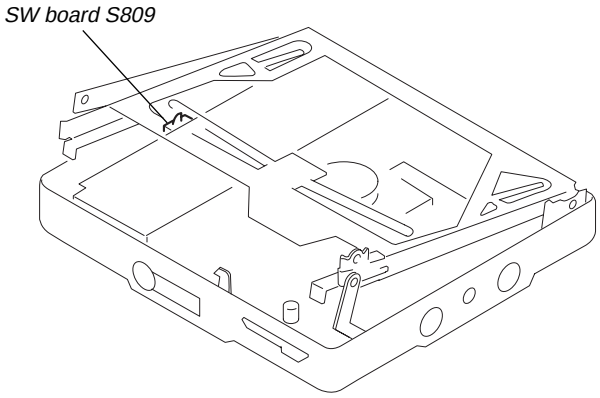
SECTION 1
SERVICING NOTE

1) When repairing this device with the power on, if you remove the main board or open the upper panel assy, this device stops working.
   In this case, you can work without the device stopping by fastening the hook of the OPEN/CLOSE switch (SW board S809) with tape.



2) This set is designed to perform automatic adjustment for each adjustment and write its value to EEPROM. Therefore, when EEPROM (SYSTEM board IC802) has been replaced in service, be sure to perform automatic adjustment and write resultant values to the new EEPROM.
   Refer to section 5 Test Mode (page 11) for details.

This section is extracted from instruction manual.

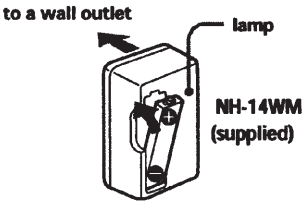
Playing an MD right away!

Charge the supplied rechargeable battery, before using it for the first time. Other choices are a dry battery and house current. For details, see "Power Sources".
Stereo or monaural playback is automatically selected, depending on the sound source.

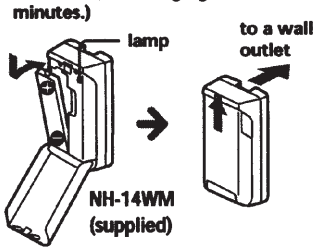
1 Charge the rechargeable battery.

After about 1.5 hours, charging ends and the lamp on the charger turns off. (To get maximum performance from battery, continue charging it for another hour after the lamp turns off.)

• **Model for USA, Canada and continental Europe (Full charging takes 80 minutes.)**



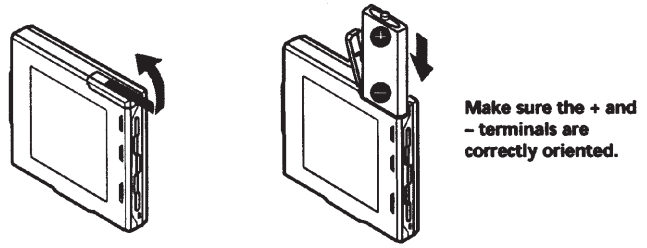
• **World model and model for other countries (Full charging takes 120 minutes.)**



2 Insert the rechargeable battery.

① **Slide open the battery compartment as shown in the illustration.**

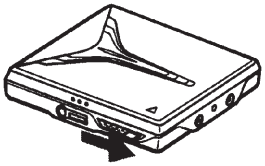
② **Insert the battery.**



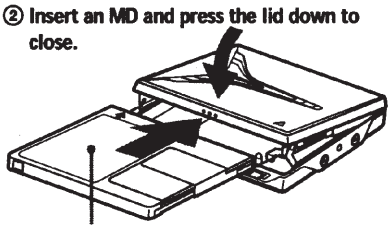
Make sure the + and – terminals are correctly oriented.

3 Insert an MD.

① **Slide OPEN.**



② **Insert an MD and press the lid down to close.**



With label facing upward, insert disc in direction of the arrow.

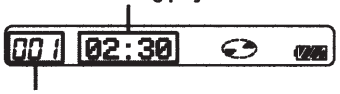
To	Do this (Beeps in the headphones)
Pause	Press ▮▮ on the remote control. (Continuous short beeps) Press ▮▮ on the remote control again to resume play.*1
Find the beginning of the current track	Press ⏮ once. Press the control towards ⏮ on the remote control. (Three short beeps)
Find the beginning of the previous tracks	Press ⏮ repeatedly. Press the control towards ⏮ on the remote control repeatedly. (Continuous three short beeps)
Find the beginning of the next track	Press ⏭ once. Press the control towards ⏭ on the remote control. (Two short beeps)
Go backwards while playing*1	Hold down ⏮. Press and hold the control towards ⏮ on the remote control.
Go forward while playing*1	Hold down ⏭. Press and hold the control towards ⏭ on the remote control.
Remove the MD	Press ■, and then slide OPEN.*2

If playback does not start
Make sure the player is not locked. For details, see "To lock the controls (HOLD)".

For models supplied with the AC plug adaptor
If the battery charger does not fit the wall outlet, use the AC plug adaptor.

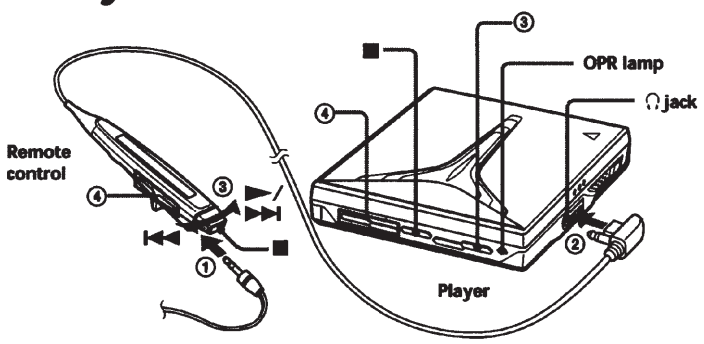
Display window while playing back
For details, see "To know the track name and time".

Track name*3 or elapsed time of the track being played



Track number

4 Play an MD.



① **Connect the headphones to the remote control.**
Plug it in firmly all the way.

② **Connect the headphones with the remote control to the jack.**

③ **Press ▶▶| ► (or press the control towards ►/▶▶| or |◀◀ on the remote control).**
The OPR lamp on the player lights up and the player starts to play the first track. When using the remote control, a short beep sounds in the headphones.

④ **Press VOLUME +/– (or press VOL +/– on the remote control) to adjust the volume.**
The volume indicator appears on the remote control to allow you to check the volume.

To stop play, press ■.
The OPR lamp on the player goes off. The display on the remote control disappears after a while. When using the remote control, a long beep sounds in the headphones.

Tips
- The OPR lamp on the player lights up on the player during playback. When you press ■, the lamp goes off.
- The display on the remote control disappears after a while after you have pressed ■.

Note
Do not slide OPEN during playback. If you do, the lid opens and playback stops.

When using optional headphones
Use headphones with a stereo-miniplug. You cannot use headphones with a microplug.

*1 When you press |◀◀ or ▶▶| ► on the player during pause (II), the player resumes playback.
If you hold down |◀◀ or ▶▶| ► on the player (or press and hold the control towards |◀◀ or ►/▶▶| on the remote control) during pause (II), you can fast forward/rewind without listening to the playback sound.

*2 Once you open the lid, the point to start playback will change to the beginning of the first track.

*3 Appears only with MDs that have been electronically labeled.

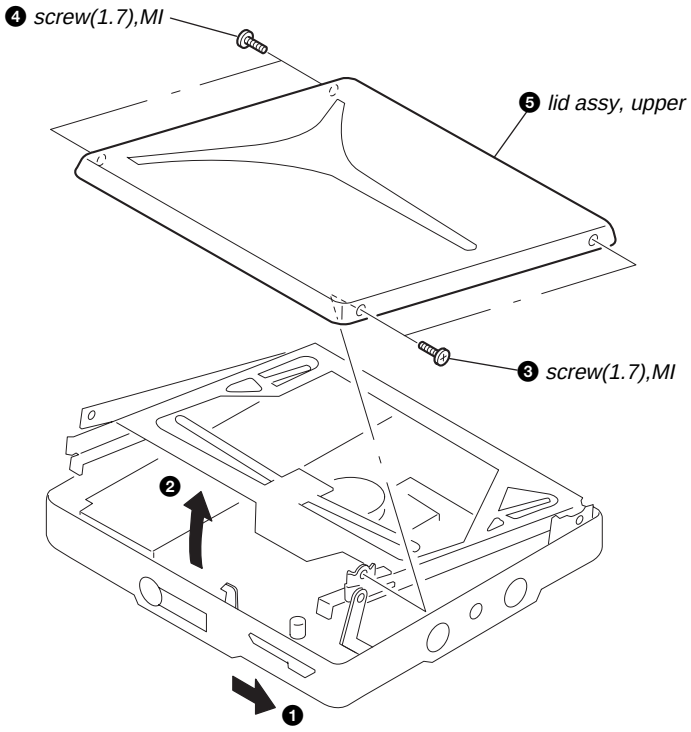
SECTION 3
DISASSEMBLY

Note : This set can be disassemble according to the following sequence.

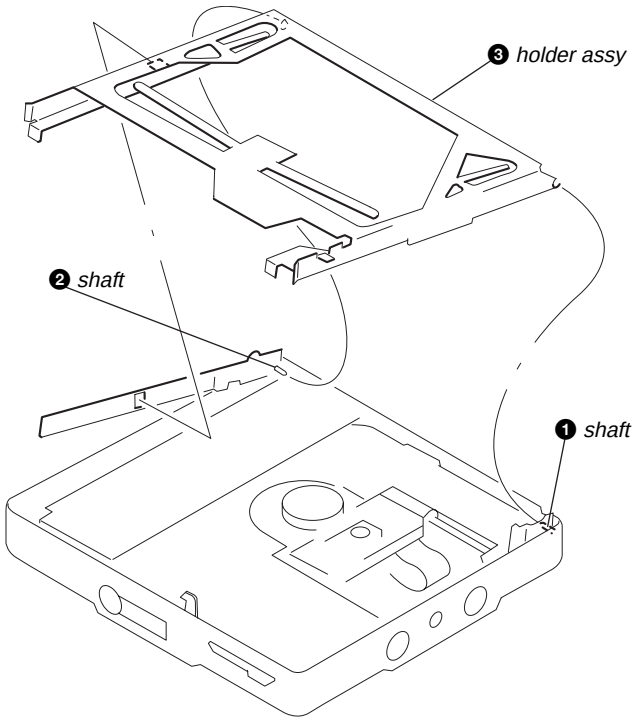
Set → Lid Assy, Upper → Holder Assy → Mechanism Deck → "Plate (L) Assy, Fulcrum ", " Plate (R) Assy, Fulcrum" → SW Board, Main Board
Mechanism Deck → System Board
Mechanism Deck → Service Assy, OP

Note : Follow the disassembly procedure in the numerical order given.

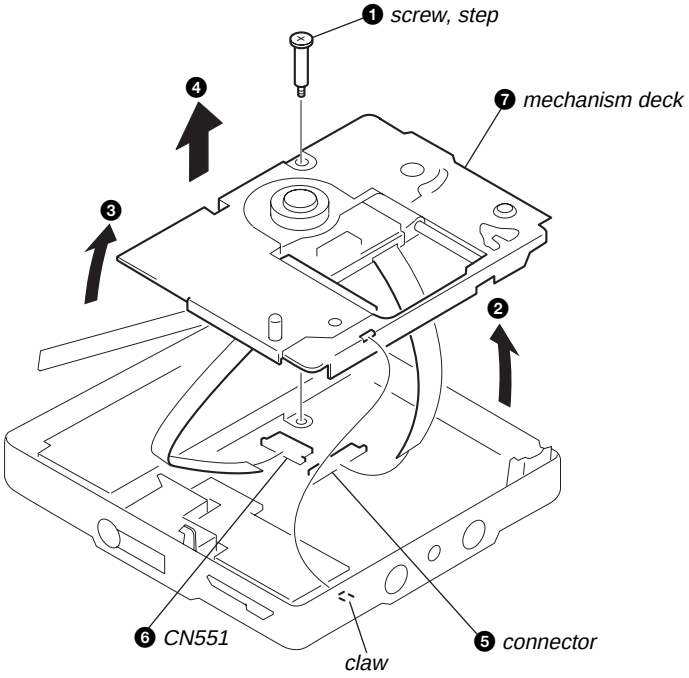
3-1. LID ASSY, UPPER



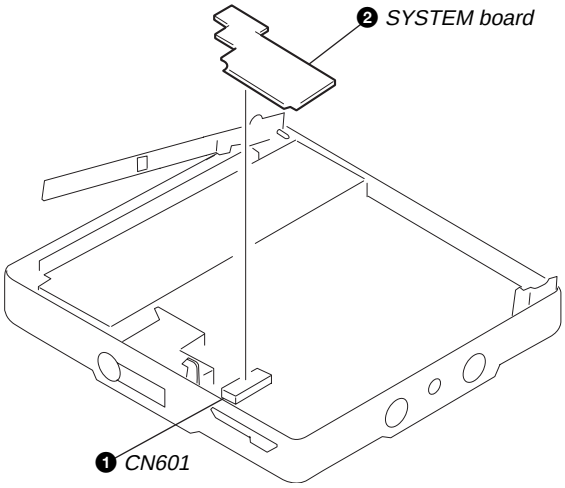
3-2. HOLDER ASSY



3-3. MECHANISM DECK

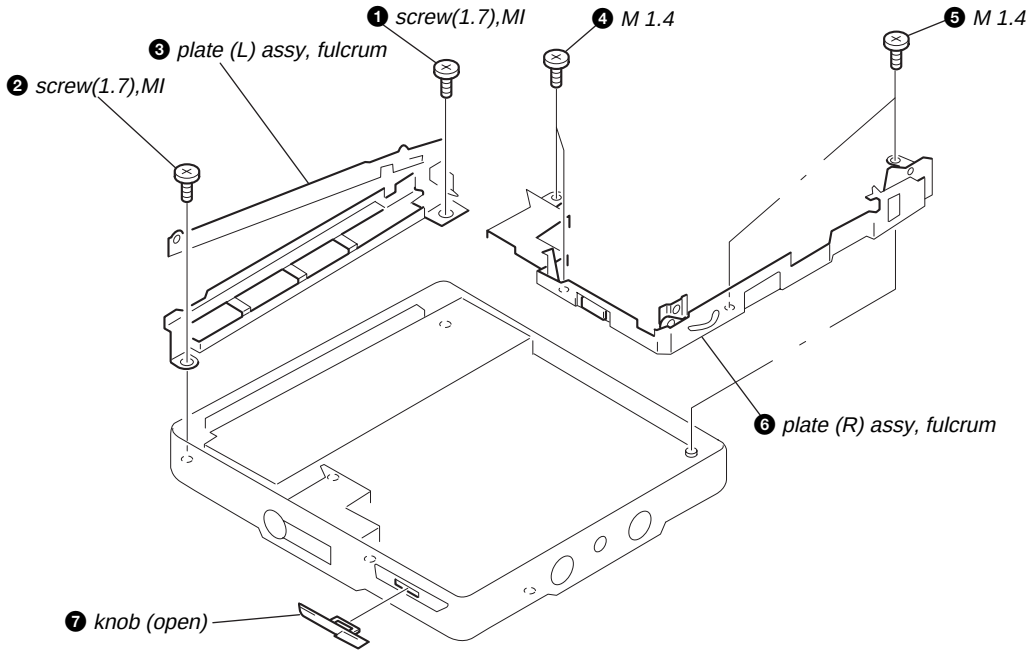


3-4. SYSTEM BOARD



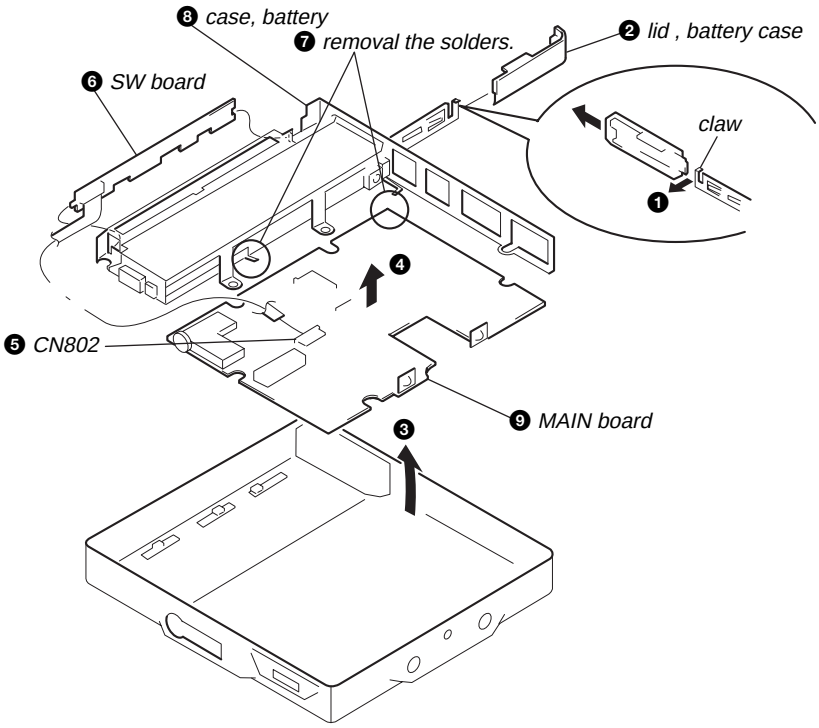
3-5. “PLATE (L) ASSY, FULCRUM”, “PLATE (R) ASSY, FULCRUM”

Note: When installing, fit the knob (OPEN).

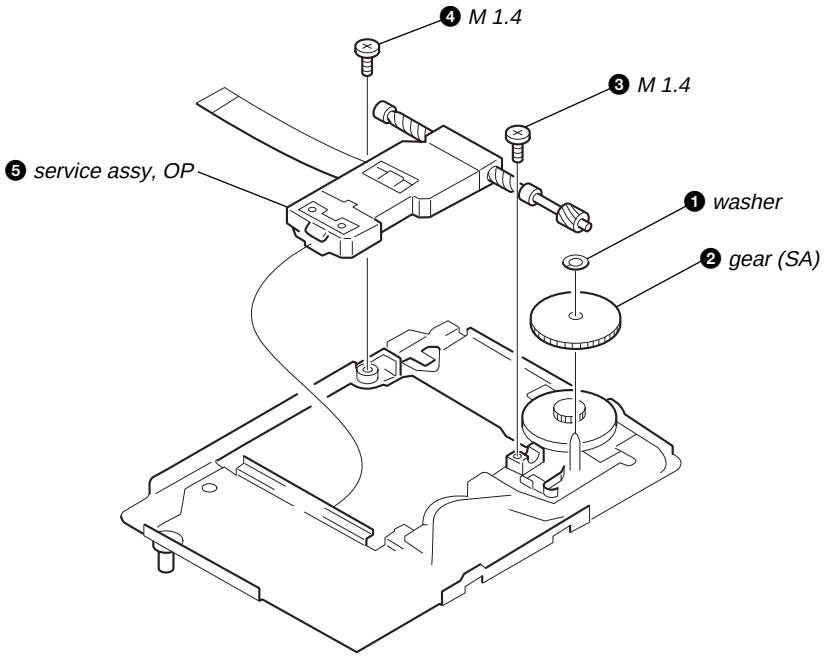


3-6. SW BOARD, MAIN BOARD

Note: When installing, fit the knobs (HOLD, MB, AVLS).



3-7. SERVICE ASSY, OP



SECTION 4
TEST MODE

4-1. GENERAL

- When entered in the TEST MODE, this set provides the Overall Adjustment mode which allows CD and MO discs to be automatically adjusted. In the Overall Adjustment mode , the system discriminates between CD and MO discs, performs adjustments in sequence automatically, and displays the faulty location if any fault is found. In the Manual mode, selected adjustments can be performed automatically.
- The attached remote control is used to operate the TEST MODE. Unless otherwise specified in the text, the key means that on the remote control.

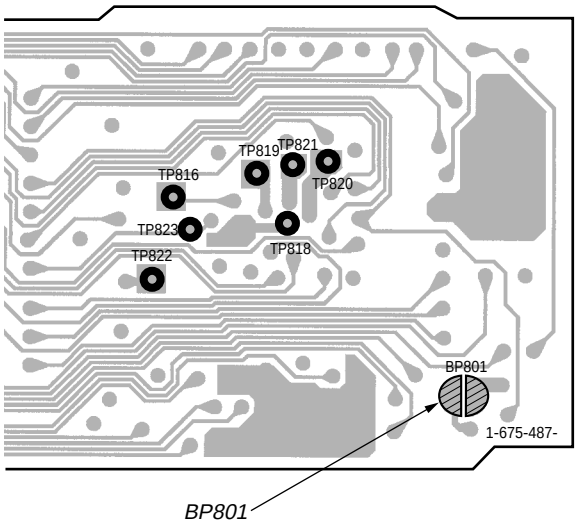
4-2. SETTING THE TEST MODE

4-2-1. How to set the TEST MODE

To set the TEST MODE, two methods are available.

① Solder bridge and short BP801 (TEST) on the system board. Then turn on the power.

【SYSTEM BOARD】 (SIDE A)



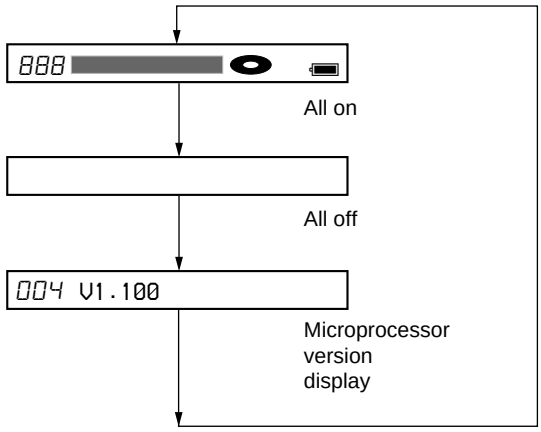
② In the normal mode, operate the keys on the set and those on the remote control as specified below:
Turn on HOLD switch on the set. Holding down ■ (STOP) key on the set, press the keys on the remote control in the following sequence:

▶▶| ▶ → ▶▶| ▶ → |◀◀ → |◀◀ → ▶▶| ▶
→ |◀◀ → ▶▶| ▶ → |◀◀ → ❚❚ → ❚❚

4-2-2. Operations when the TEST MODE is set

When the TEST MODE is entered, the system switches to the display check mode within the TEST MODE. From this mode, the other Test modes can be accessed.
When the TEST MODE is set, the LCD repeats a cycle of the following displays:

Remote control LCD

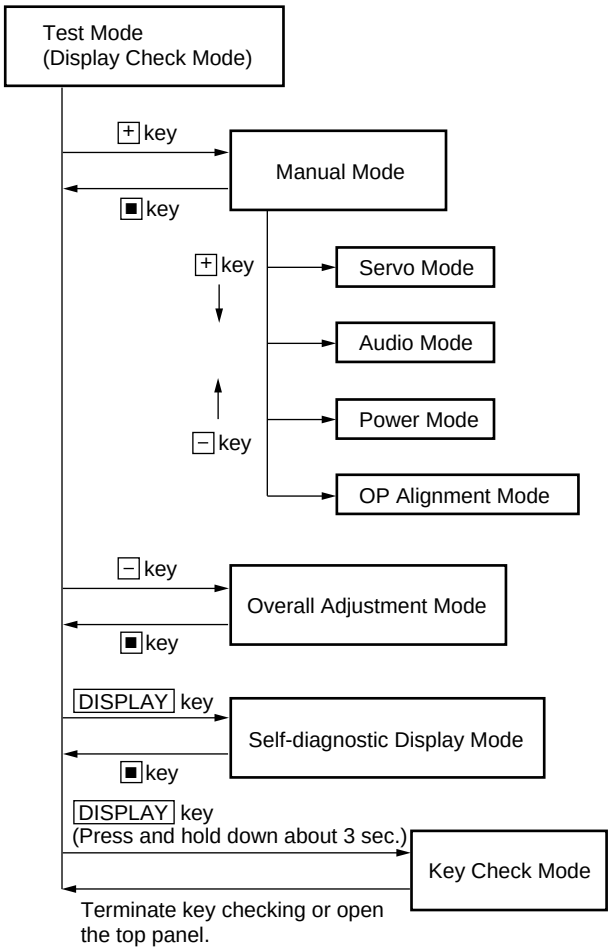


- Press and hold down ❚❚ to hold the current display while the key is being pressed.

4-2-3. How to release the TEST MODE

When method ① was used:
Turn off the power and open the solder bridge on BP801on the system board.
Note: The solder should be removed clean. The remaining solder may make a short with the chassis and other part.
When method ② was used:
Turn off the power.

4-3. TEST MODE STRUCTURE



4-4. MANUAL MODE

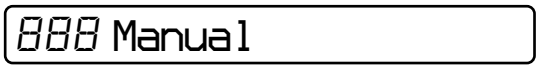
4-4-1. Outline of the function

The Manual mode is designed to perform adjustments and operational checks on the set's operation according to each individual function.
Usually, no adjustments are made in this mode.
However, the Manual mode is used to clear the memory before performing automatic adjustments in the Overall Adjustment mode.

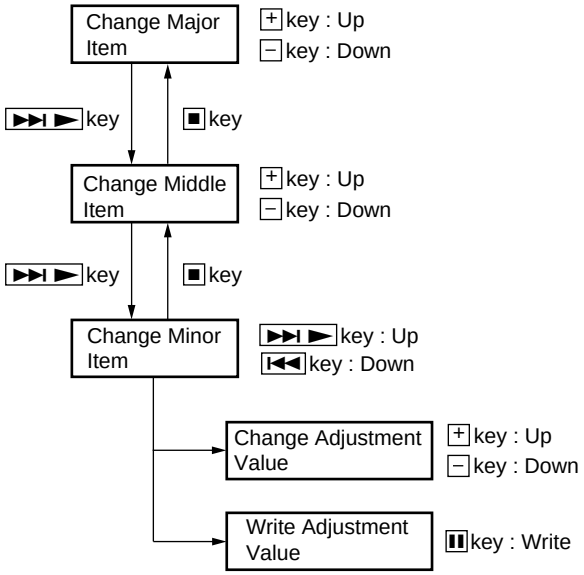
4-4-2. How to set the Manual mode

1. Set the TEST MODE and press [+] key to set the Manual mode.

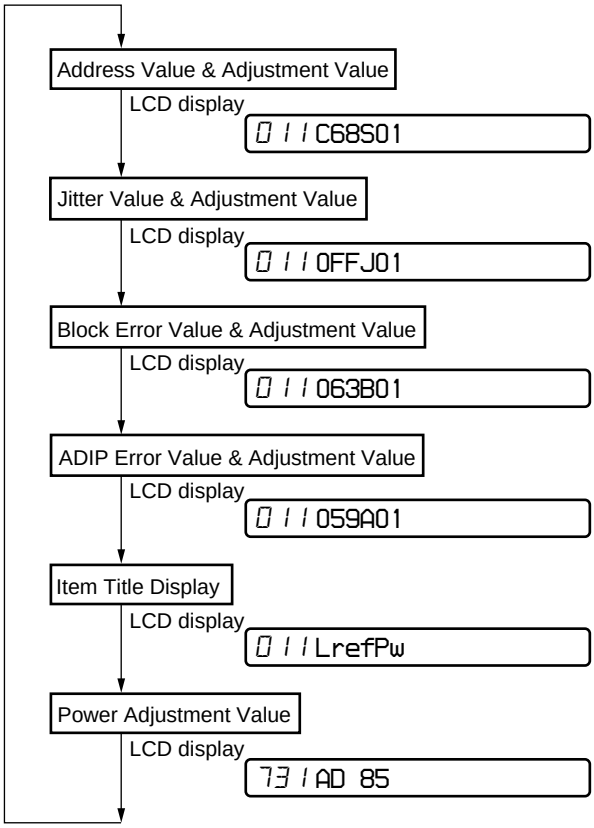
   Remote control LCD display

2. Each test item is assigned with a three-digit item number. The third digit stands for a major item, the second digit for a middle item, and the first digit for a moniro item.



3. During each test mode, the display is changed from one to another each time [DISPLAY] key is pressed.



Note: In the Power mode, the power adjustment value is only displayed.

4. During each test, press and hold down [⏭] key or [⏮] key for a while to move the optical pickup on the sled outer or inner perimeter.

5. To terminate the Manual mode and return to the TEST MODE, press [■] key.

4-5. OVERALL ADJUSTMENT MODE

4-5-1. Outline of the function

This mode is designed to adjust the servo system automatically by going through all the adjustment items.
Usually, this mode is used to perform automatic adjustments when servicing the set.

For further information, refer to section 5. ELECTRICAL ADJUSTMENTS (page 15).

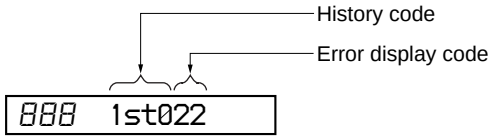
4-6. SELF-DIAGNOSTIC DISPLAY MODE

4-6-1. Outline of the function

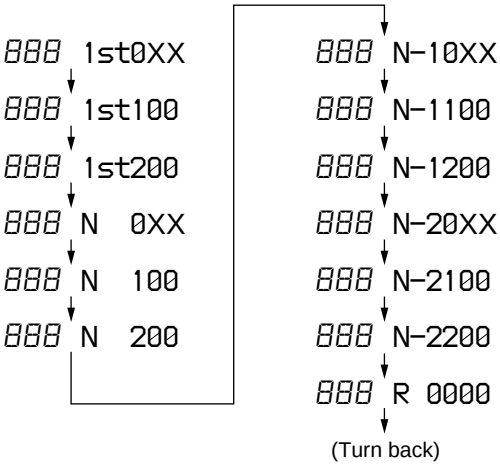
The Self-diagnostic system is used in this set. If an error occurs during playback, this system detects the fault through the microprocessor's mechanism and power control blocks and stores the cause in EEPROM in a history format.
This history, which can be viewed in the TEST MODE, provides the means of locating the fault in troubleshooting.

4-6-2. Self-diagnostic mode

1. Set the TEST MODE.
2. With all the LCD display segments blinking on the set, press DISPLAY key and the Self-diagnostic mode is entered.



3. Hereinafter, each time ▶▶I ▶ key is pressed, the reference information display changes as follows:



- Press I◀◀ key to go back to the previous display.

• Contents of the history codes

History code number		Contents
1st	0	The first error that occurred.
1st	1	Displays 00.
1st	2	
N	0	The last error that occurred.
N	1	Displays 00.
N	2	
N-1	0	The first error from the last one.
N-1	1	Displays 00.
N-1	2	
N-2	0	The second error from the last one.
N-2	1	Displays 00.
N-2	2	
REC		Total recording time (0000 is displayed for MZ-E90.)

• Description of the error display codes

Contents of fault	Display code	Meaning of code	Description
No error	00	No error	
Servo system error	01	Access target address illegally specified	An attempt to access an abnormal address.
	02	HIGH TEMP	HIGH TEMP
	03	FOCUS ERROR	Focus off-center.
	04	SPINDLE ERROR	Abnormal rotation of disc
AUDIO error	11		
	12		
	13		
Power system error	21	INIT LOWBATT	Abnormal voltage during initialization
	22	LOWBATT	Instantaneous interruption detected.
	23	LOWBATT NI	Instantaneous interruption detected (NiMH).
	24	LOWBATT AM	Instantaneous interruption detected (AM).

4-6-3. Clearing the error display code

After servicing, reset the error display code.

1. Set the TEST MODE. (See page 11)
2. To reset the error display code, press II key on the remote control when the code is displayed.
   (All the data on the 1st, N, N-1 and N-2 will be reset.)

4-7. KEY CHECK MODE

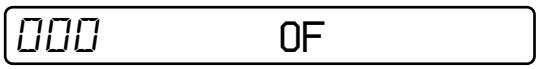
4-7-1. Outline of the function

This mode is used to check to make sure that each of the keys (including the slide switch) on the set operates normally.

4-7-2. Setting the Key Check mode

1. Set the TEST MODE. Press and hold down [DISPLAY] key (for more than 3 sec) to set the Key Check mode.

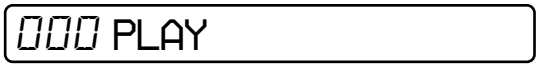
   LCD display

2. When each key on the set and on remote control is pressed, its name is displayed on the LCD. (The operated position is displayed for 4 sec after the slide switch is operated. If any other key is pressed during this display, the LCD switches to its name display.)

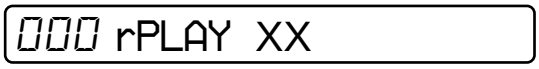
   Example: When [▶▶I ►] key on the set is pressed:

   LCD display

   Example: When [▶▶I ►] key on the remote control is pressed:

   LCD display

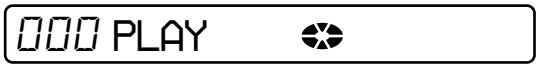
   

   XX: AD value of the remote control key (hexadecimal 00 to FF)

3. When all the keys on the set and on the remote control are considered as OK, the following displays are shown for 2 sec. (The key pressed to enter the Key Check mode has been checked even if it is not pressed in this mode.)

   Example: When the keys on the set are considered as OK:

   LCD display

   Example: When the keys on the remote control are considered as OK:

   LCD display

4. When all the key have been checked or when the top panel is opened during this checking, the system terminates the Key Check mode and return to the TEST MODE.

SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. GENERAL

In this set, CD and MO discs can be automatically adjusted by setting the Overall Adjustment mode within the TEST MODE, Before performing these automatic adjustments, it is necessary to clear the memory and adjust the power in the Manual mode.

5-2. NOTES FOR ADJUSTMENT

5-2-1. Jigs

- CD disc TDYS-1 (part code: 4-963-646-01)
- MO disc PTDM-1 (part code: J-2501-054-A)
  or commercially available MO disc (recorded)
- Digital voltmeter

5-2-2. Adjustment sequence

The adjustments should be always performed in the following sequence:

① Reset NV (Clear the memory) ↓ ② Manual power adjustments — Manual mode

③ Overall CD adjustments ↓ ④ Overall MO adjustments — Overall adjustment mode

5-2-3. Power

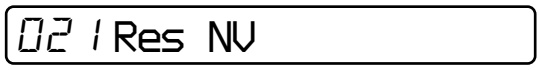
The power is supplied with 1.5 V DC from the DC IN jack.

5-3. RESET NV

5-3-1. How to reset NV

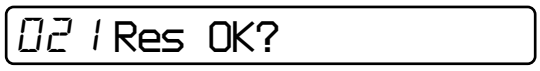
1. Set the TEST MODE. (See page 11)
2. Set the Manual mode and set the item No. 021, Reset NV. (See page 12)

   LCD display

3. Press [II] key on the remote control.

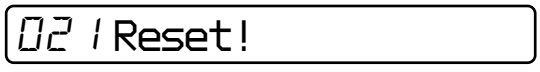
   LCD display

4. Press [II] key on the remote control again.

   LCD display

   After reset is completed.

5. Press [■] key to terminate the Manual mode and return to the TEST MODE.

5-4. MANUAL POWER ADJUSTMENTS

5-4-1. Adjustment sequence

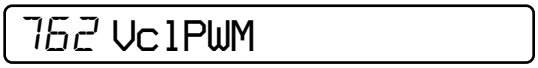
The adjustments should be always performed in the following sequence:

① Vc PWM Duty (L) adjustment (item No.:762)
↓
② Vrem PWN duty (L) adjustment (item No.:764)
↓
③ Vc PWM duty (H) adjustment (item No.:765)
↓
④ Vrem PWM Duty (H) adjustment (item No.:766)

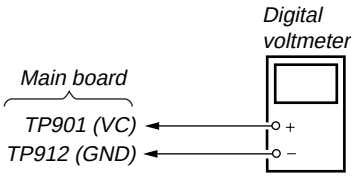
5-4-2. Vc PWM Duty (L) adjustment method

1. Confirm that the power voltage is at 1.5 V DC.
2. Set the TEST MODE. (See page 11)
3. Set the Manual mode and set the item No. to 762. (See page 12)

   LCD display

4. Connect a digital voltmeter to TP901 on the main board and adjust [+] key (voltage up) and [–] key (voltage down) on the remote control so that the voltage is at 2.32V $^{+5\,mV}_{-10\,mV}$.



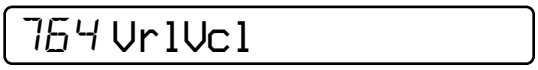
5. Press [II] key to write the adjustment value.

Note : Do not Press the [II] key if the adjustment value is already set.

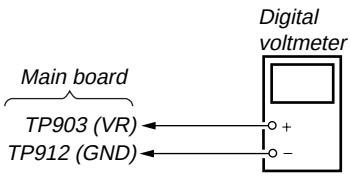
5-4-3. Vrem PWM Duty (L) adjustment method

1. Set the Manual mode and set the item No. to 764. (See page 12)

   LCD display

2. Connect a digital voltmeter to TP903 on the main board and adjust [+] key and [–] key on the remote control so that the voltage is at 2.25V $^{+5\,mV}_{-10\,mV}$.



3. Press [II] key to write the adjustment value.

Note : Do not Press the [II] key if the adjustment value is already set.

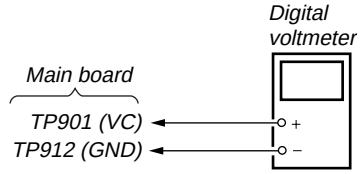
5-4-4. Vc PWM Duty (H) adjustment method

1. Set the Manual mode and set the item No. to 765. (See page 12)

   LCD display

   765 VchPWM

2. Connect a digital voltmeter to TP901 on the main board and adjust [+] key and [–] key on the remote control so that the voltage is at 2.75V ± 15 mV.



3. Press [II] key to write the adjustment value.

Note : Do not Press the [II] key if the adjustment value is already set.

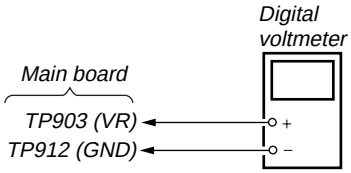
5-4-5. Vrem PWM Duty (H) adjustment method

1. Set the Manual mode and set the item No. to 766. (See page 12)

   LCD display

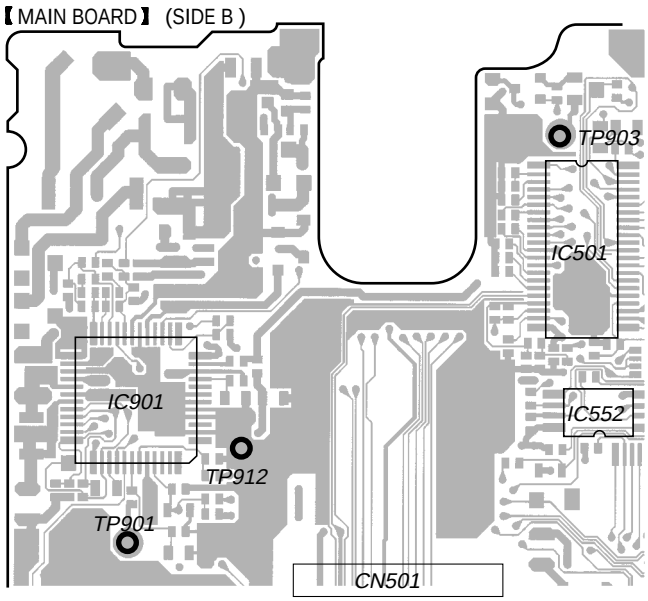
   766 VrhVch

2. Connect a digital voltmeter to TP903 on the main board and adjust [+] key and [–] key on the remote control so that the voltage is at 2.6 ± 15 mV.



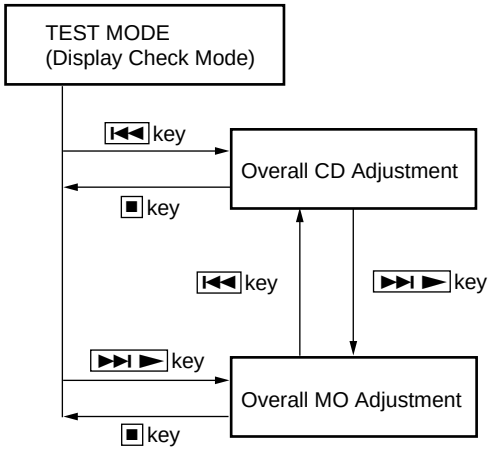
3. Press [II] key to write the adjustment value.

Note : Do not Press the [II] key if the adjustment value is already set.



5-5. OVERALL ADJUSTMENT MODE

5-5-1. Overall adjustment mode structure



Note: The overall adjustments should be always performed in the sequence of CD → MD adjustments.

5-5-2. Overall CD and MO adjustment method

1. Set the TEST MODE (see page 11) and press [–] key to set the Overall Adjustment mode.

   LCD display

   000 AssyFF

2. Insert CD disc in the set, and press [⏮] key to set the Overall CD Adjustment mode.
   Automatic adjustments are made.

   LCD display

   XXX CD RUN

   XXX: Item No. for which an adjustment is being executed.

3. If NG in the overall CD adjustments, return to Reset NV and perform the adjustment again.

   LCD display

   XXX NG

   XXX: NG item No.

4. If OK through the overall CD adjustments, then perform overall MO adjustments.

   LCD display

   XXX CD OK

5. Insert MO disc in the set, and press [⏭] key to set the Overall MO Adjustment mode. Automatic adjustments are made.

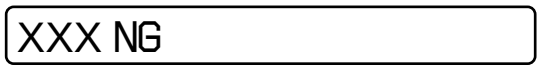
   LCD display

   XXX MO RUN

   XXX: Item No. for which an adjustment is being executed.

6. If NG in the overall MO adjustments, return to Reset NV and perform the adjustment again.

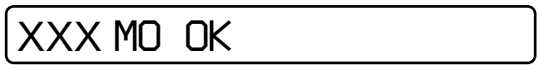
   LCD display

   XXX: NG item No.

7. If OK through the overall MO adjustments, press ■ key to return to the TEST MODE and terminate the Overall Adjustment mode.

   LCD display

5-5-3. Overall CD and MO adjustment items

1. Overall CD adjustment items

Item No.	Contents
312 313 314	CD electrical offset adjustment
328	CD TWPP gain adjustment
321	CD TE gain adjustment
323 332	CD TE offset adjustment
336	CD ABCD level adjustment
344	CD focus gain adjustment
345	CD tracking gain adjustment
521 522	CD two-axis sensitivity adjustment
341	CD focus bias adjustment

2. Overall MO adjustment items

Item No.	Contents
112 113 114 118	MO electrical offset adjustment
221	Low reflective CD TE gain adjustment
223 232	Low reflective CD TE offset adjustment
236	Low reflective CD ABCD level adjustment
244	Low reflective CD focus gain adjustment
245	Low reflective CD tracking gain adjustment
121	MO TE gain adjustment
122	MO TE offset adjustment
134	MO TWPP gain adjustment
131 132	MO TWPP offset adjustment
136	MO ABCD level adjustment
144	MO focus gain adjustment
145	MO tracking gain adjustment
141	MO focus bias adjustment

SECTION 6
DIAGRAMS

6-1. IC PIN DESCRIPTION

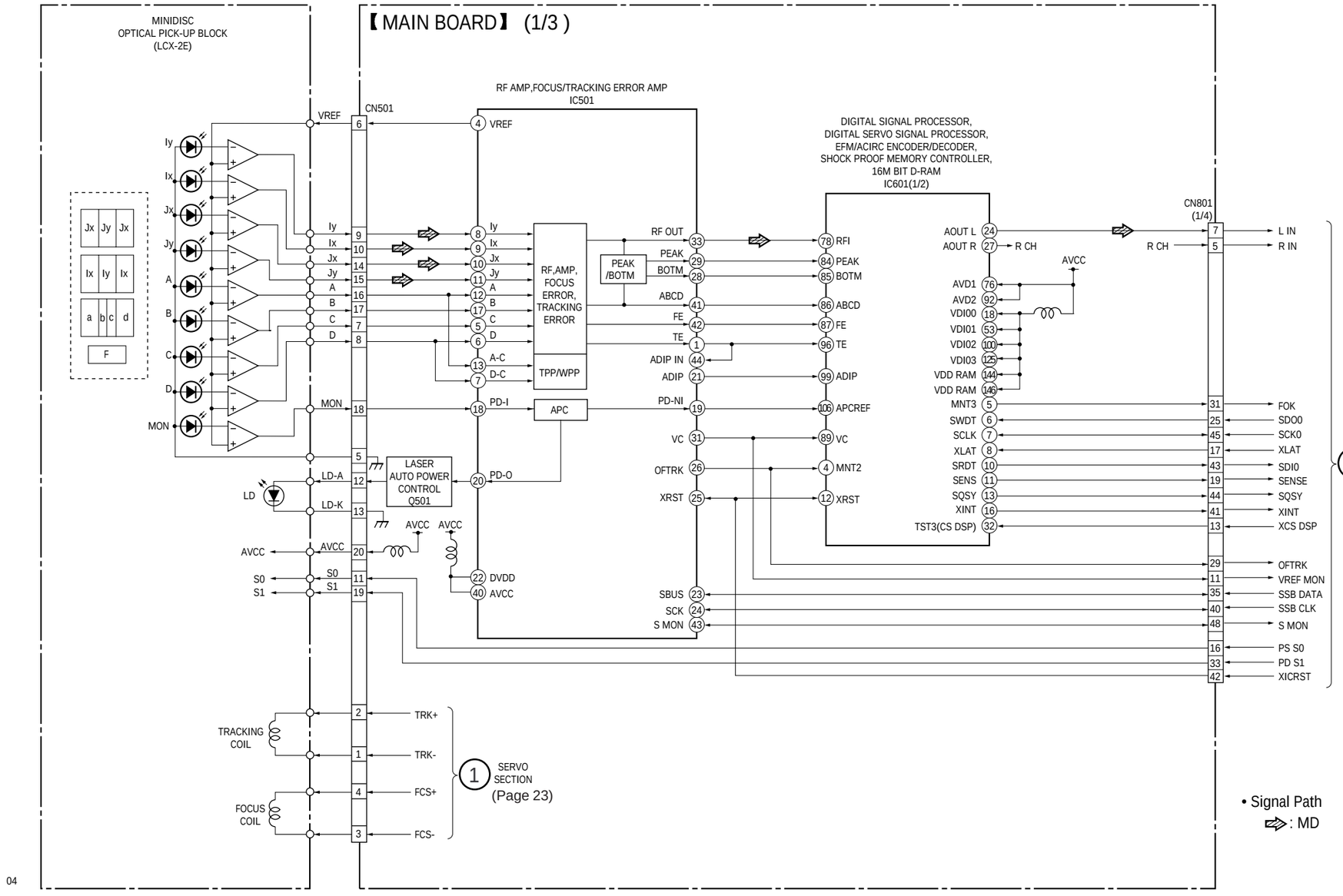
6-1-1. IC801 CXR701080-006GA (SYSTEM CONTROL)

Pin No.	Pin name	I/O	Pin Description
1	NC	—	Not used. (Open)
2	OFTRK	I	OFTRK DLY signal input
3 – 5	NC	—	Not used. (Open)
6	SENSE	I	DSP SENS monitor signal input
7	NC	—	Not used. (Open)
8	XLAT	O	DSP latch signal output
9	XCS DSP	O	DSP chip select signal output
10	NC	—	Not used. (Open)
11	SI0	I	Serial data signal input
12	SO0	O	Serial data signal output
13	SCK0	I/O	Serial clock signal input/output
14	NC	—	Not used. (Open)
15	VSS	—	Ground
16	VDD	I	Power supply pin
17	NC	—	Not used. (Open)
18	BEEP	O	BEEP control signal output
19	RMC DTCK	I/O	TSB data signal input/output
20 – 22	NC	—	Not used. (Open)
23	XHP STBY	O	HP amp power control signal output
24	CLV U	I/O	CLV control/monitor signal input/output
25	CLV V	I/O	CLV control/monitor signal input/output
26	CLV W	I/O	CLV control/monitor signal input/output
27 – 32	NC	—	Not used. (Open)
33	LD ON	O	Not used.
34	NC	I	Not used. (Fix to VDD.)
35	SLD MON1	I	SLED monitor signal input
36	PD S0	O	PD IC mode select signal output
37	REG CTL CLK	O	Not used.
38	PD S1	O	PD IC mode select signal output
39	FFCLR	O	Start signal input latch output
40	SLEEP	O	SLEEP signal output
41	NC	I	Not used. (Fix to ground.)
42	NC	—	Not used. (Open)
43	XRST	I	Reset signal input (L: RESET)
44	VSS	—	Ground
45	XTAL	O	Main oscillation/internal clock frequency connect pin
46	EXTAL	I	Main oscillation/internal clock frequency connect pin
47	VDD	I	Power supply pin
48	NC	—	Not used. (Open)
49	SPDL START SW	O	SPDL start select signal output
50	NC	—	Not used. (Open)
51	NC	I	Not used. (Fix to VDD.)
52	FOK	I	FOK signal detect input.
53	SQSY	I	Sub Q SYNC detect signal input
54	NC	I	Not used. (Fix to VDD.)
55	XINT	I	SFSY, AISY, DISY detect signal input
56 • 57	NC	—	Not used. (Open)

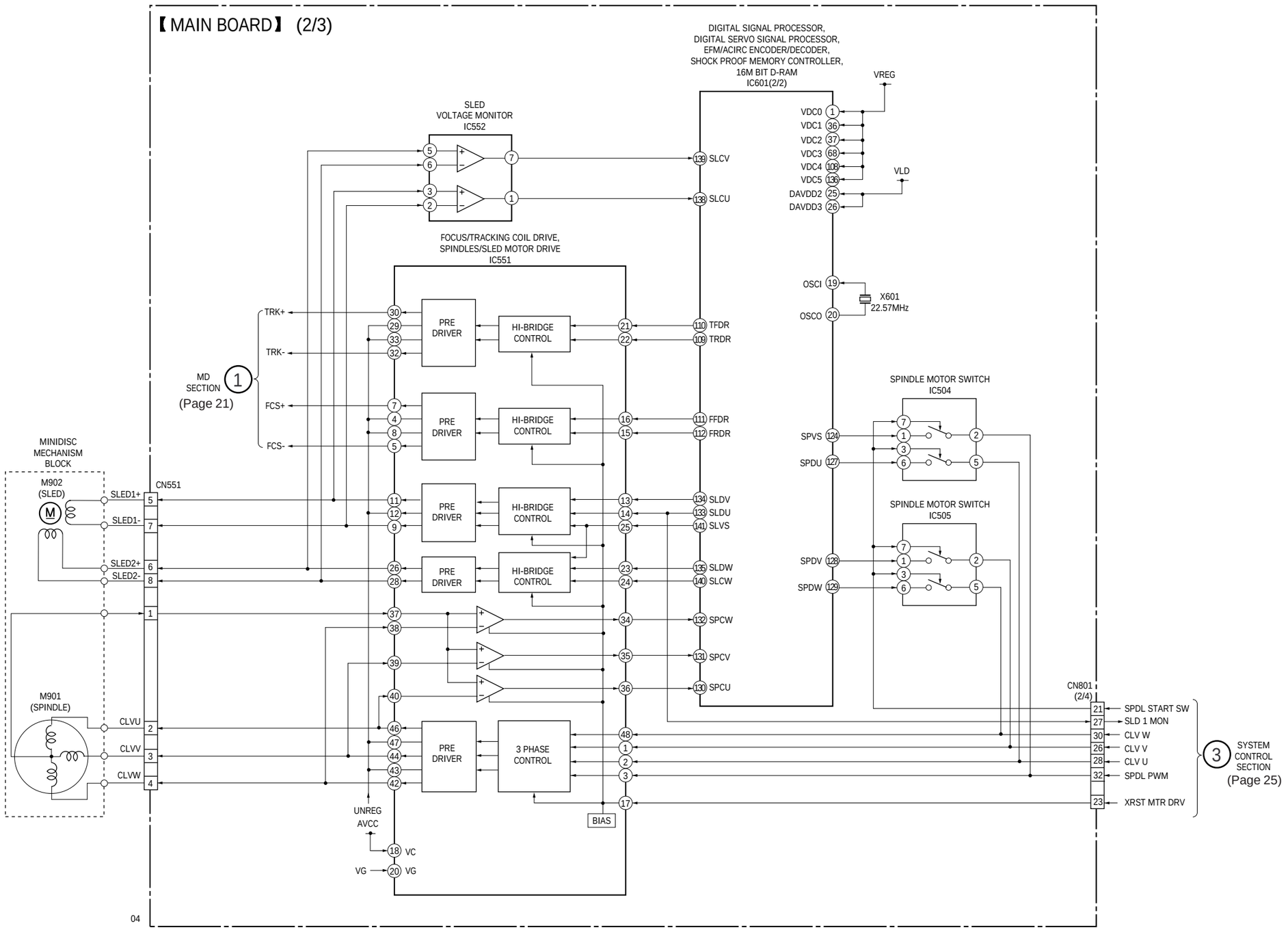
Pin No.	Pin name	I/O	Pin Description
58	SERON	O	Series power control signal output
59	NC	—	Not used. (Open)
60	X TEST	I	Test mode detect signal input
61	SET CODE0	I	Destination pin (Fix to ground.)
62	SET CODE1	I	Destination pin (Fix to ground.)
63	SET CODE2	I	Destination pin (Open)
64	REG CTL PWM	O	Synchronization external clock signal output
65	VRM PWM	I	VREM power voltage control PWM signal input
66	VC PWM	I	System power voltage control PWM signal input
67	SPDL PWM	O	SPDL start control PWM signal output
68	XIC RST	O	Reset signal output
69	OPR LED	O	OPR LED light control signal
70	NC	I	Not used. (Fix to “L”.)
71 • 72	NC	—	Not used. (Open)
73	X HOLD SW	I	HOLD SW detect signal input
74	VDD	—	Power supply pin
75 • 76	NC	—	Not used. (Open)
77	VSS	—	Ground
78	VBKAN	I	Sub power supply pin
79	S MON	I	Servo signal monitor input
80	VB MON	I	UNREG power voltage monitor input
81	NC	—	Not used. (Fix to “L”.)
82	VREF MON	I	CLEA reference voltage monitor signal input
83	WK DET	I	KEY WAKE detect signal input
84	OPEN CLOSE SW	I	OPEN SW detect signal input
85	RMC KEY	I	Remote control key detect signal input
86	SET KEY1	I	This set key detect 1 signal input
87	DBB SW	I	DBB SW detect signal input
88	NC	I	Not used. (Fix to “H”.)
89	VRM MON	I	VREM voltage monitor signal input
90	NC	I	Not used. (Fix to “L”.)
91	AVSS	—	Ground
92	AVREF	—	AD reference voltage
93	AVDD	—	Power supply pin
94	TEST0	—	Test pin (Fix to “L”.)
95	TEST1	—	Test pin (Fix to “L”.)
96	TDI	—	Not used. (JTAG pin)
97	TMS	—	Not used. (JTAG pin)
98	TCX	—	Not used. (JTAG pin)
99	TEST	—	Not used. (JTAG pin)
100	TDO	—	Not used. (JTAG pin)
101	NC	—	Not used. (Open) (TSB clock control signal output)
102	SSB DATA	I/O	SSB data signal input/output
103	SSB CLK	I/O	SSB clock signal input/output
104	FLASH WR EN	I	FLASH write enable signal input (H: Write)
105	VDD	—	Power supply pin
106	VSS	—	Ground
107 – 109	NC	—	Not used. (Fix to “H”.)
110 • 111	NC	—	Not used. (Open)

Pin No.	Pin name	I/O	Pin Description
112	XRST MTR DRV	O	Reset signal output. (L: Reset)
113 • 114	NC	—	Not used. (Open)
115	XAVLS	I	AVLS SW detect signal input (L: ON)
116	NC	—	Not used. (Open)
117	MUTE	O	Analog mute signal output (H: MUTE)
118	NC	—	Not used. (Open)
119	XCS NV	O	EEPROM chip select signal output
120	NC	—	Not used. (Open)

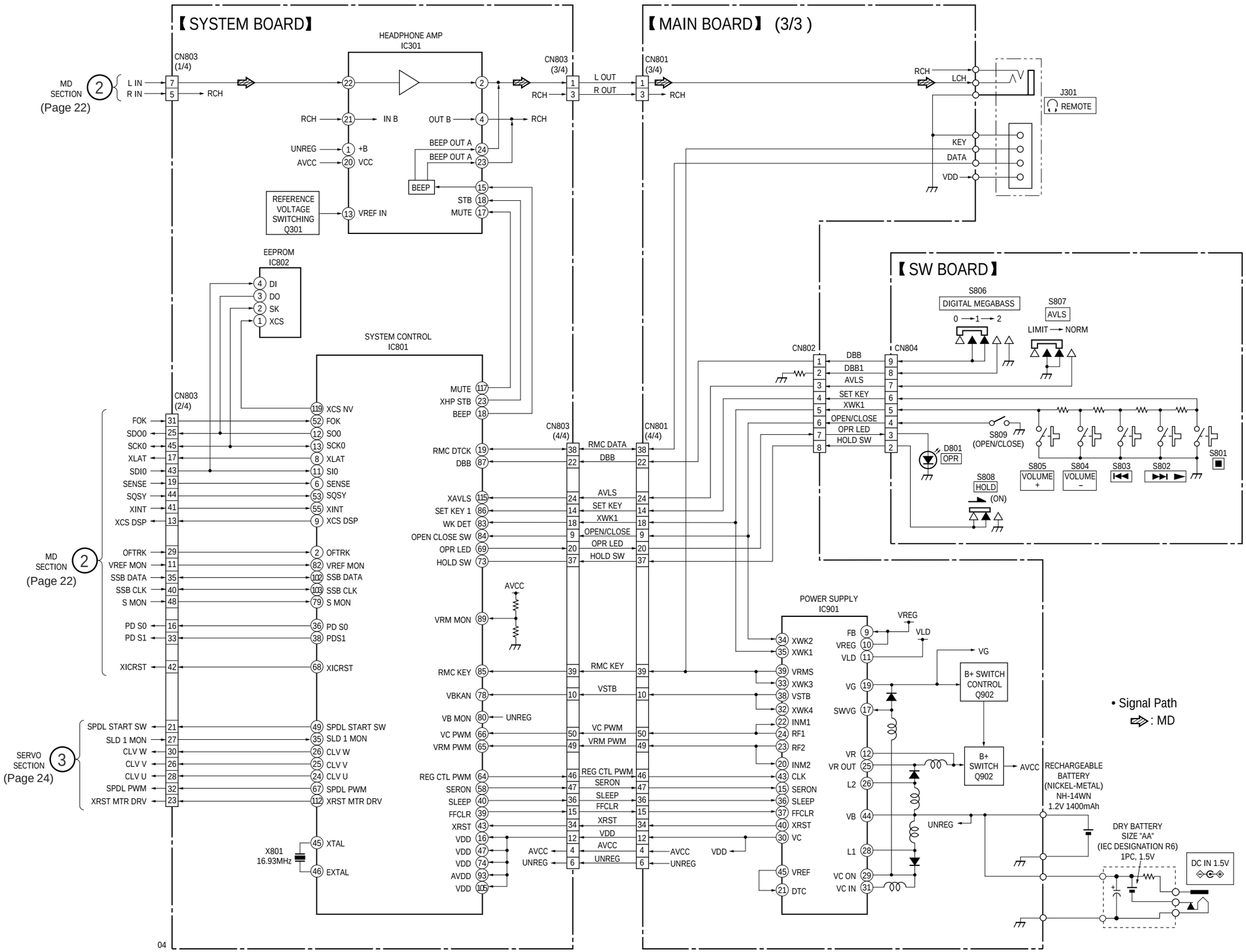
6-2. BLOCK DIAGRAMS
6-2-1. MD BLOCK DIAGRAM



6-2-2. SERVO BLOCK DIAGRAM



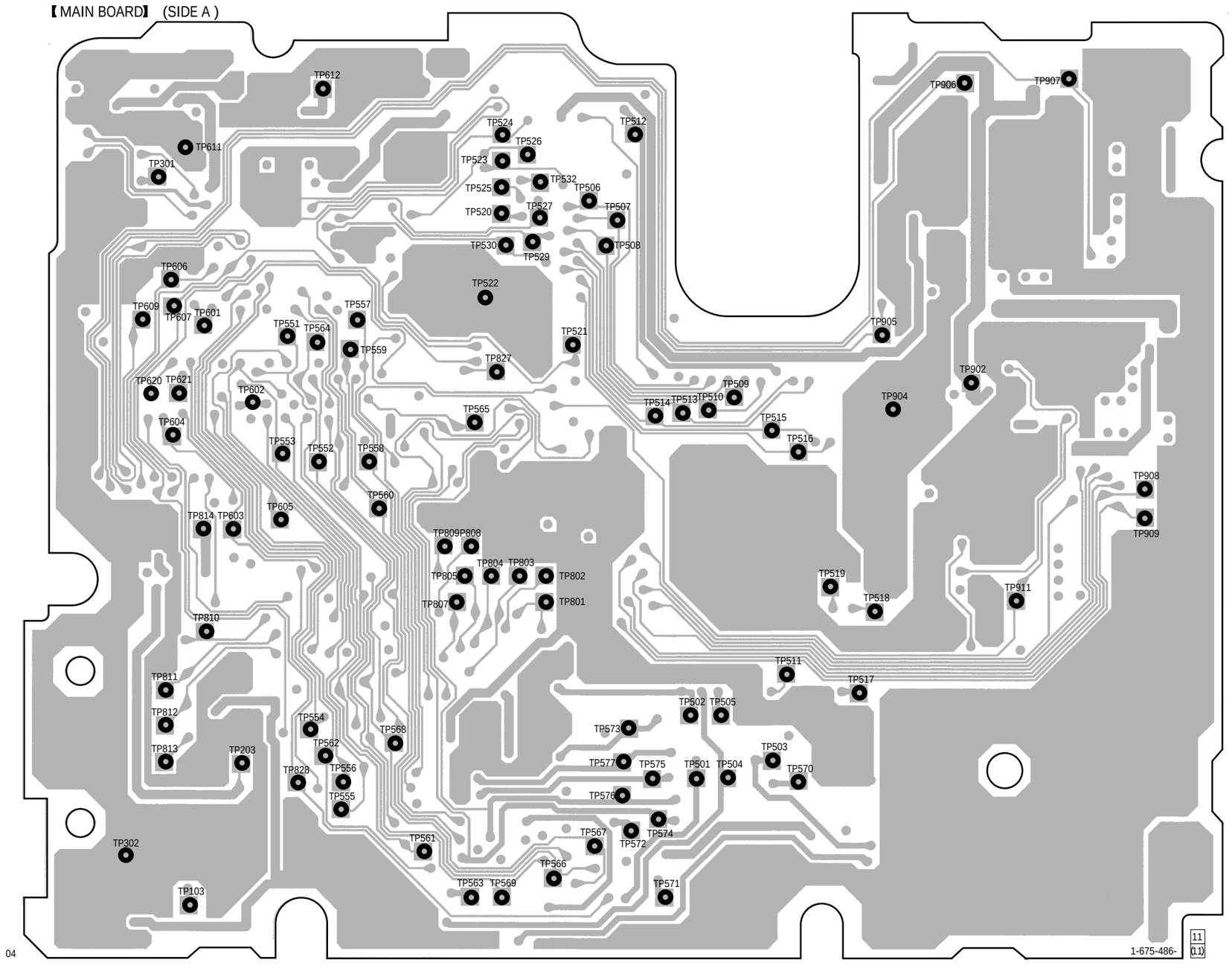
6-2-3. SYSTEM CONTROL BLOCK DIAGRAM



6-3. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

6-3-1. PRINTED WIRING BOARD — MAIN BOARD —

【MAIN BOARD】 (SIDE A)



Note:

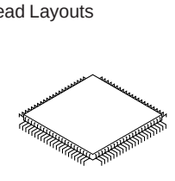
- ——— : parts extracted from the conductor side.
- △ : internal component.
- ▒▒▒ : Pattern from the side which enables seeing. (The other layer's patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

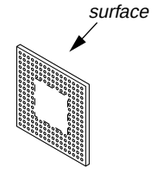
- Main board is four-layer printed board. However, the patterns of layers 2 and 3 have not been included in this diagrams.

∗ IC601 is not replaceable

- Lead Layouts



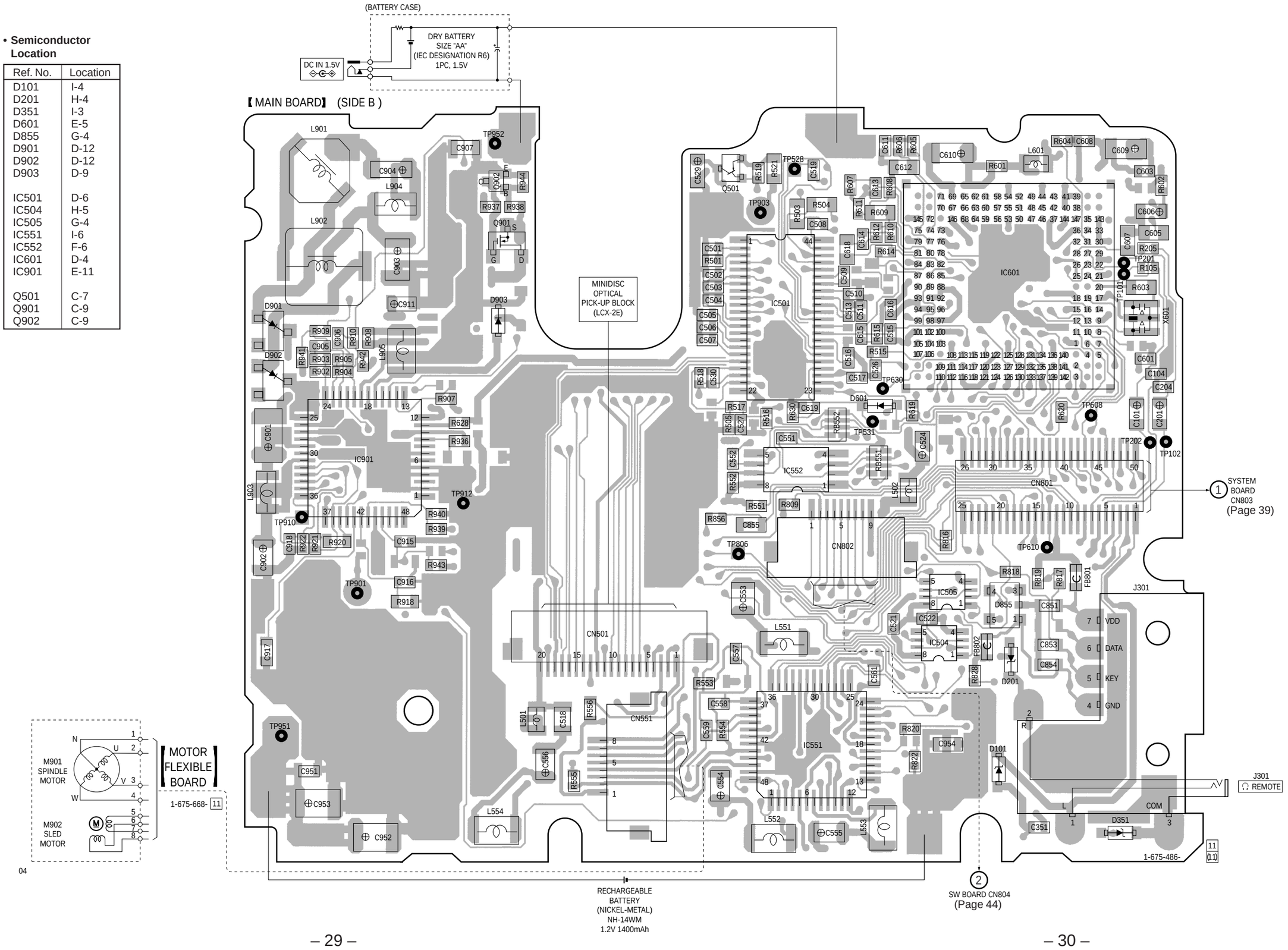
Lead layout of conventional IC



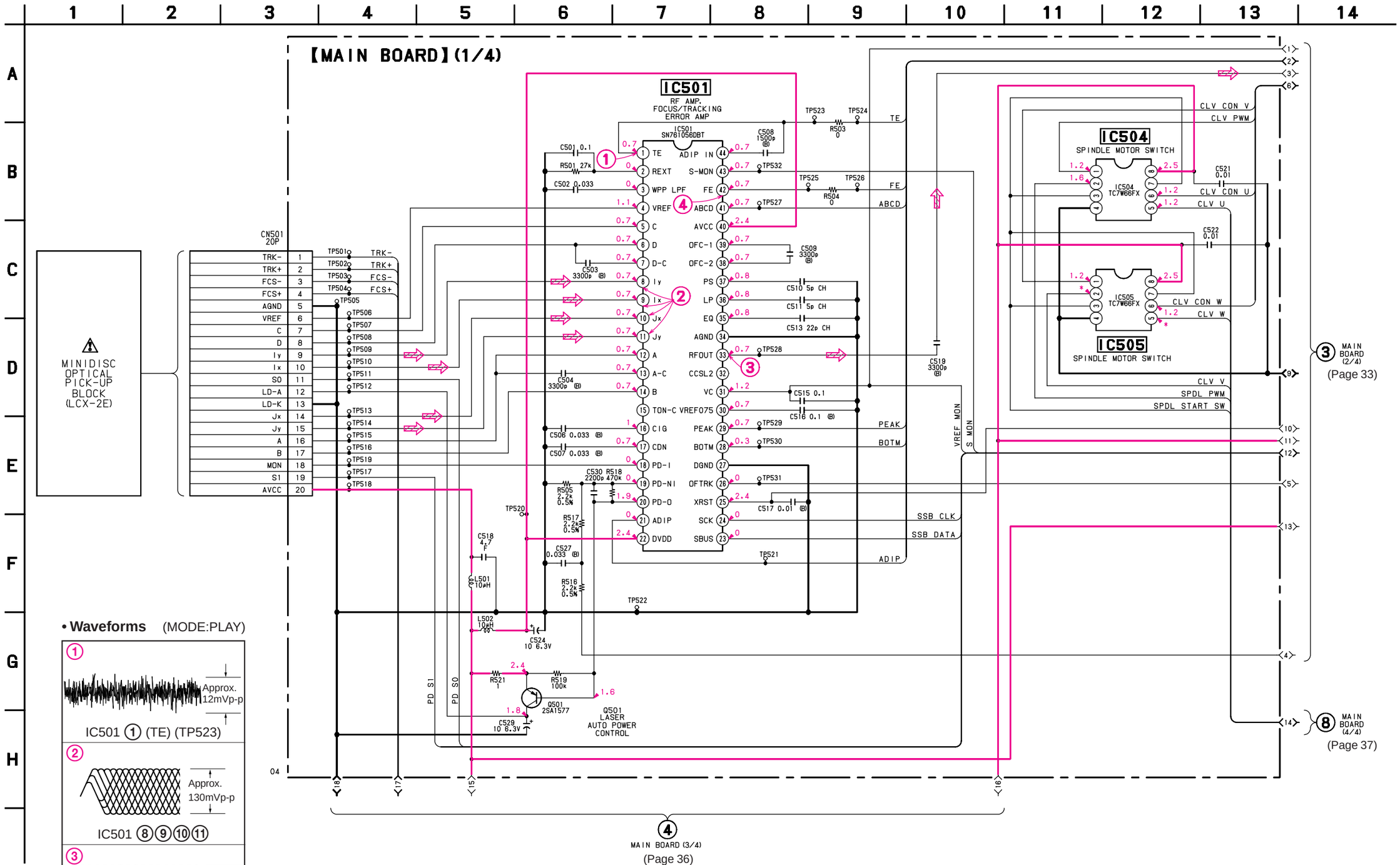
CSP (chip size package)

- **Semiconductor Location**

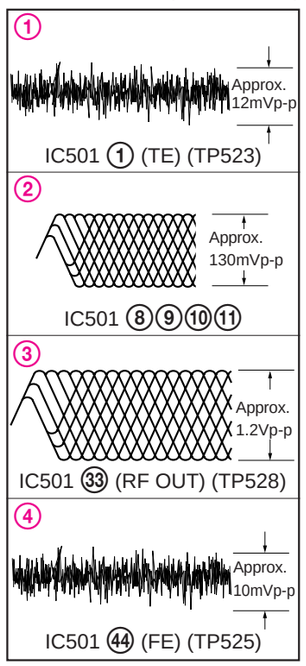
Ref. No.	Location
D101	I-4
D201	H-4
D351	I-3
D601	E-5
D855	G-4
D901	D-12
D902	D-12
D903	D-9
IC501	D-6
IC504	H-5
IC505	G-4
IC551	I-6
IC552	F-6
IC601	D-4
IC901	E-11
Q501	C-7
Q901	C-9
Q902	C-9



6-3-2. SCHEMATIC DIAGRAM — MAIN BOARD (1/4) — • Refer to page 46 for IC Block Diagrams.



• **Waveforms** (MODE:PLAY)

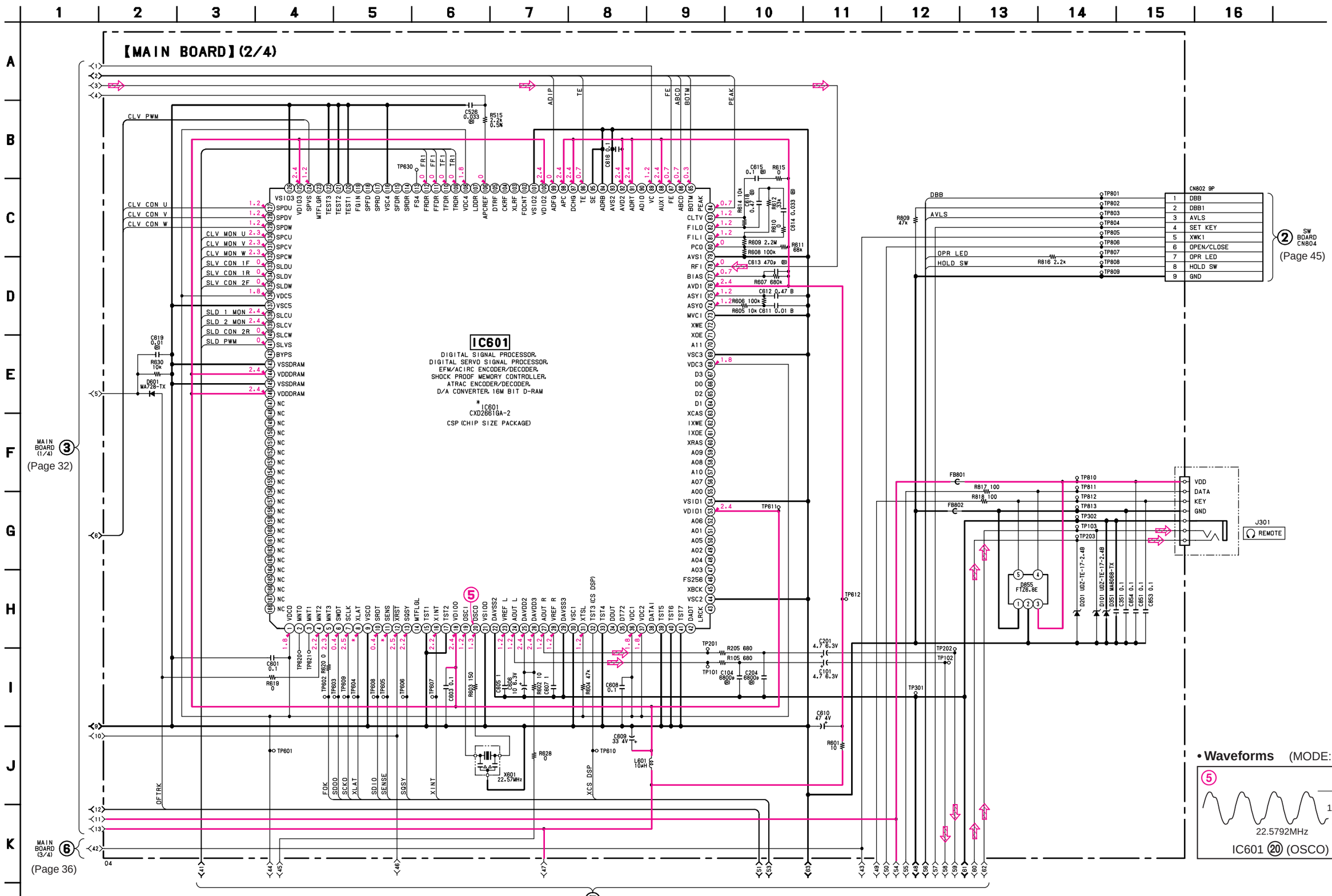


Note:
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- % : indicates tolerance.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- ▬▬ : B+ Line.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  ＊ : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : PB

6-3-3. SCHEMATIC DIAGRAM — MAIN BOARD (2/4) —



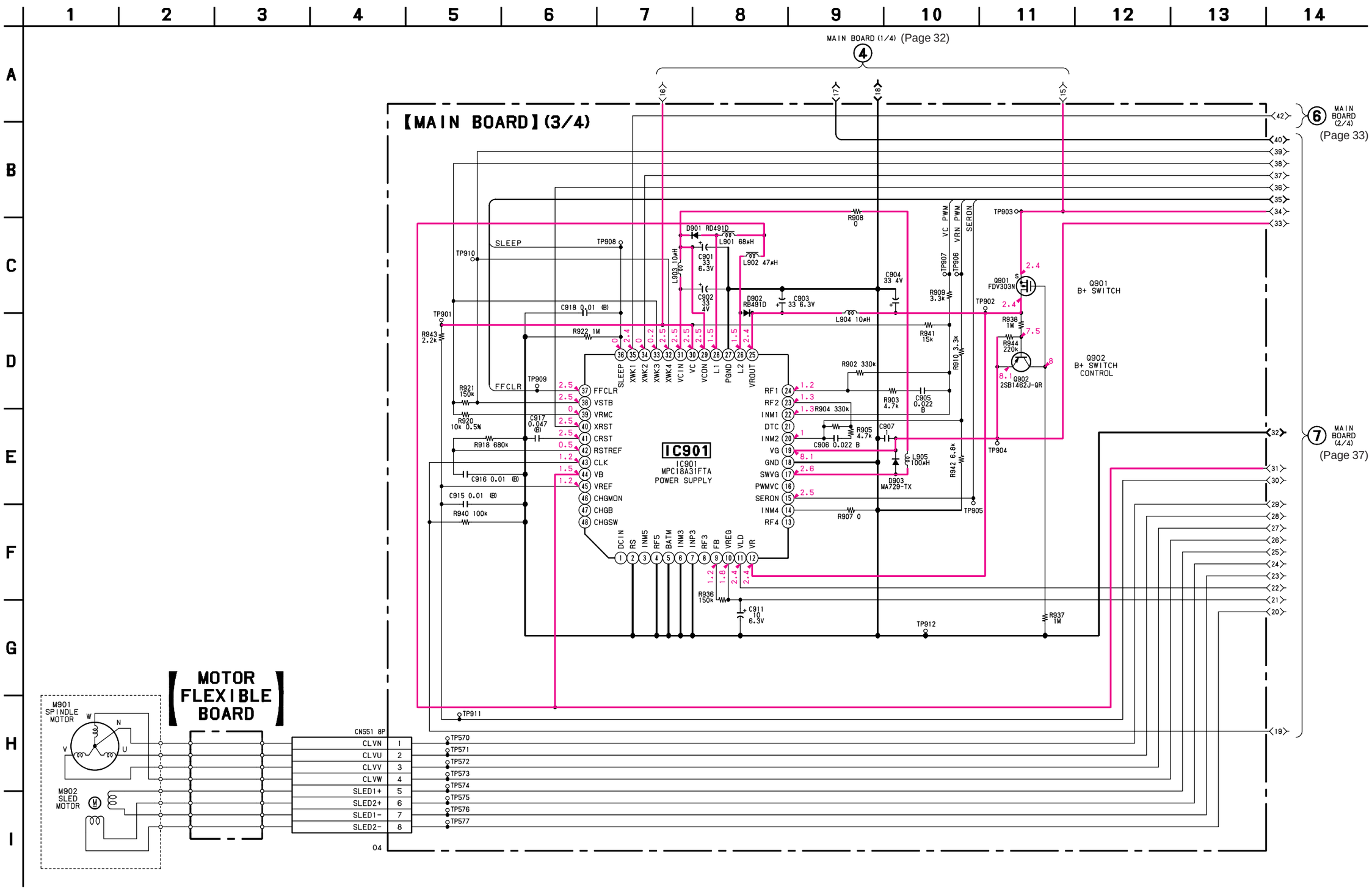
Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.
- △ : internal component.
- ▬▬ : B+ Line.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  * : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : PB

∗ IC601 is not replaceable

- The voltage and waveform of CSP (chip size package) cannot be measured, because its lead layout is different form that of conventional IC.

6-3-4. SCHEMATIC DIAGRAM — MAIN BOARD (3/4) — • Refer to page 48 for IC Block Diagrams.



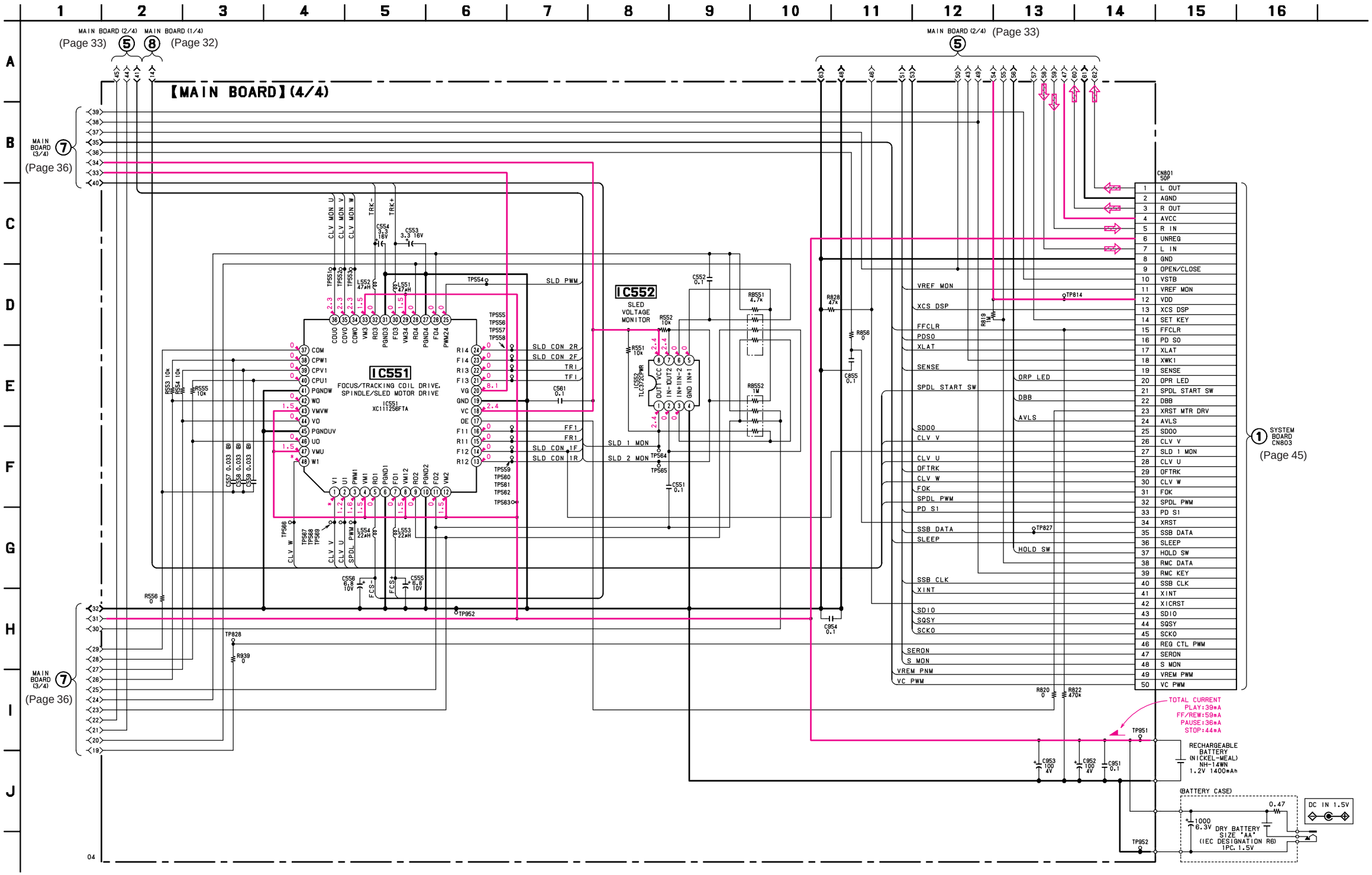
Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.

- ▬▬ : B+ Line.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltage is dc with respect to ground under no-signal condition.
  no mark : PB
  ＊ : Impossible to measure

- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : PB

6-3-5. SCHEMATIC DIAGRAM — MAIN BOARD (4/4) — • Refer to page 47 for IC Block Diagrams.



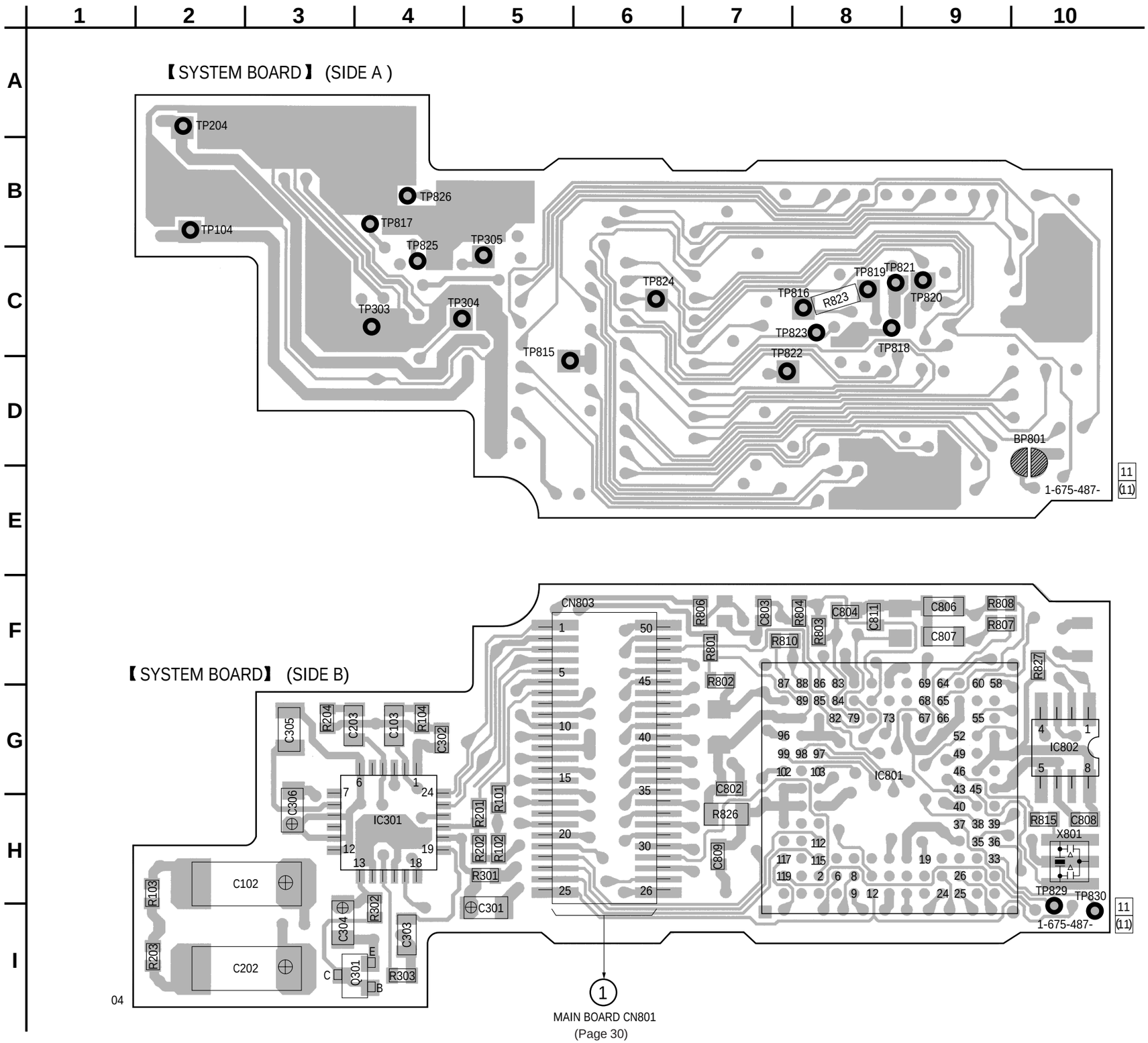
Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- % : indicates tolerance.

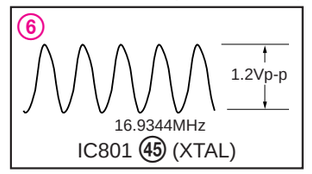
- ▬▬ : B+ Line.
- Total current is measured with minidisc installed.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltage is dc with respect to ground under no-signal condition.
  no mark : PB
  * : Impossible to measure

- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : PB

6-3-6. PRINTED WIRING BOARD — SYSTEM BOARD —



• **Waveforms** (MODE:PLAY)



• **Semiconductor Location**

Ref. No.	Location
IC301	H-4
IC801	G-8
IC802	G-10
Q301	I-3

Note:

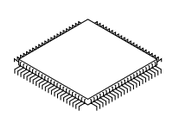
- △ : internal component.
- ▒▒ : Pattern from the side which enables seeing. (The other layer's patterns are not indicated.)

Caution:
Pattern face side: (Side B) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A) Parts on the parts face side seen from the parts face are indicated.

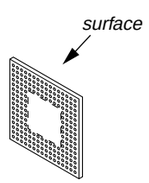
- System board is four-layer printed board. However, the patterns of layers 2 and 3 have not been included in this diagrams.

∗ IC801 is not replaceable

- Lead Layouts

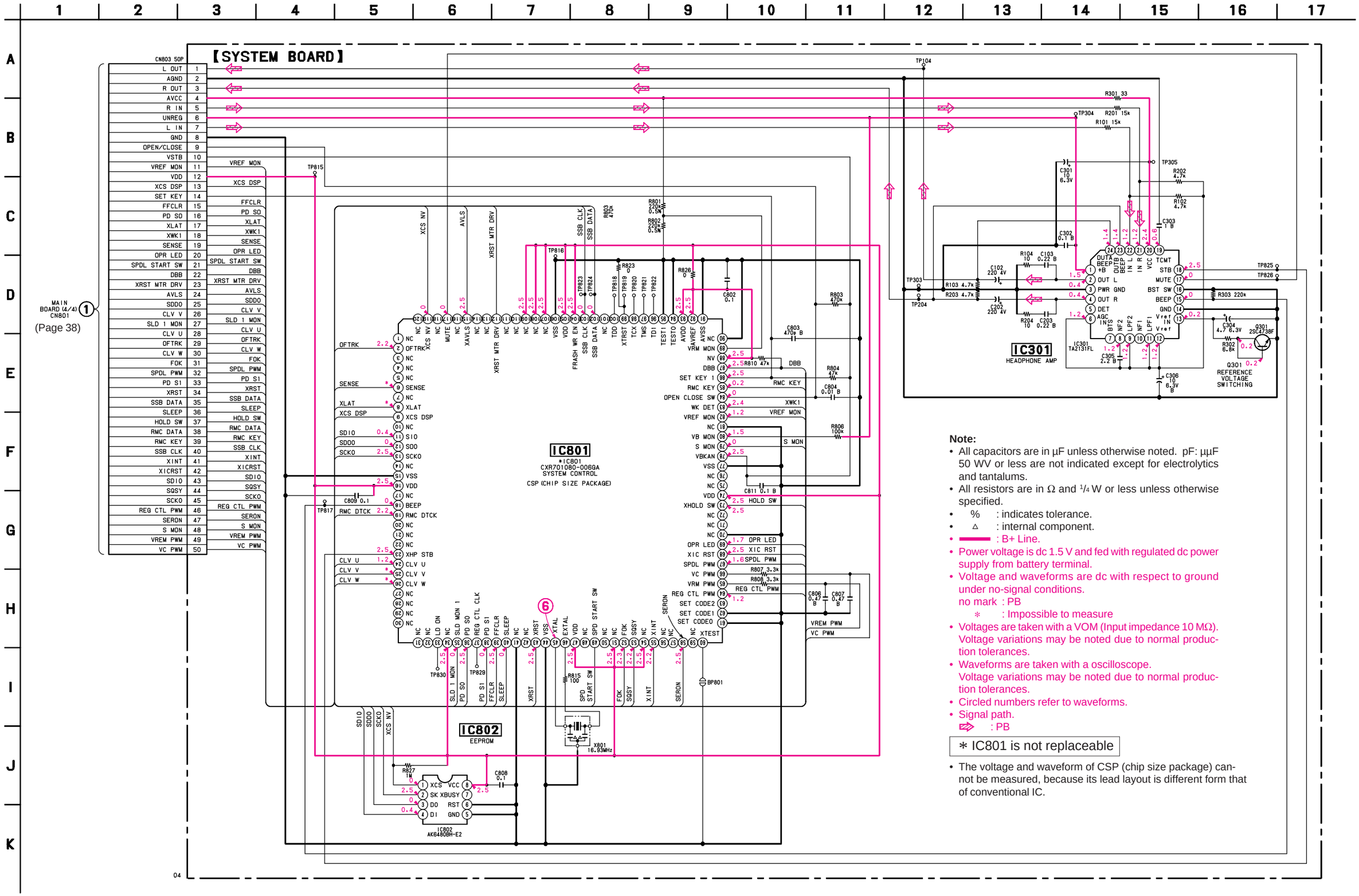


Lead layout of conventional IC

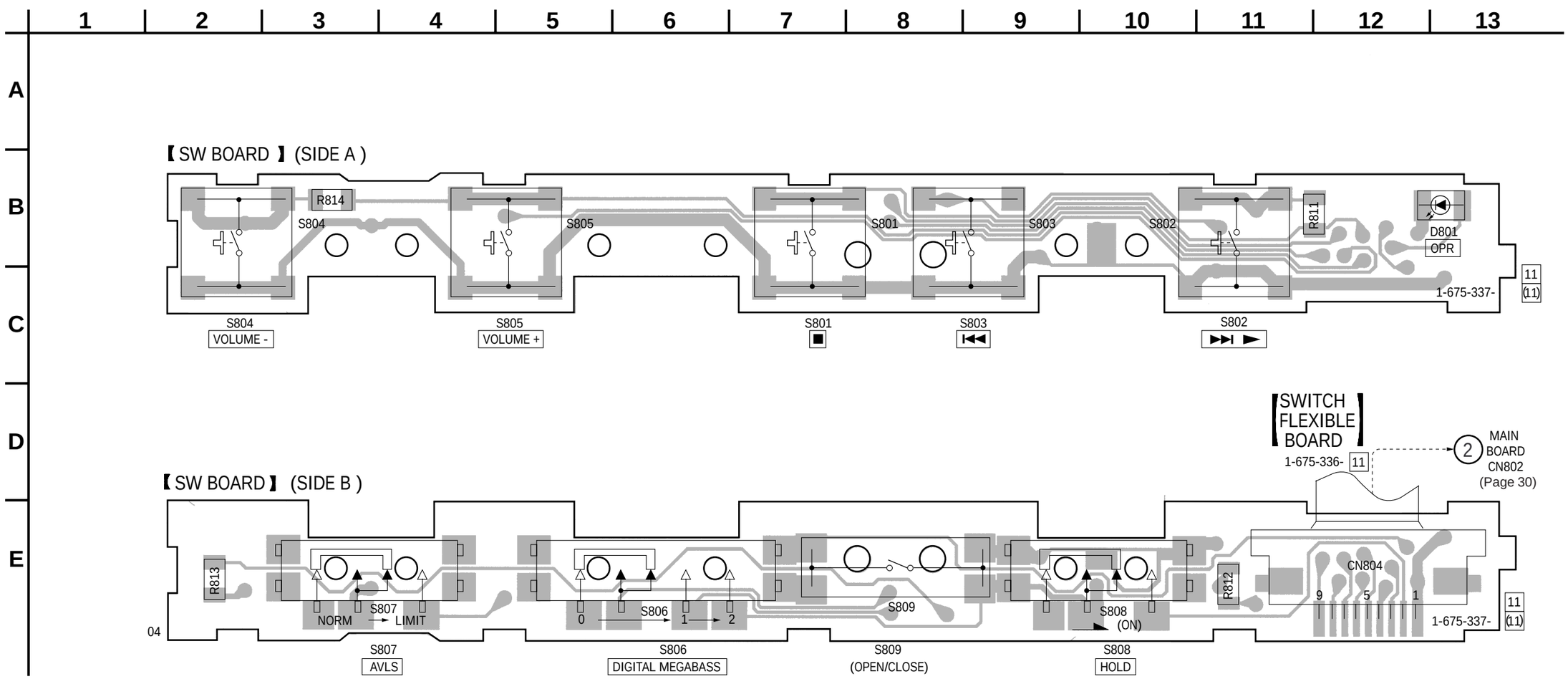


CSP (chip size package)

6-3-7. SCHEMATIC DIAGRAM — SYSTEM BOARD — • Refer to page 46 for IC Block Diagrams. • Refer to page 40 for Waveform.



6-3-8. PRINTED WIRING BOARD — SW BOARD —

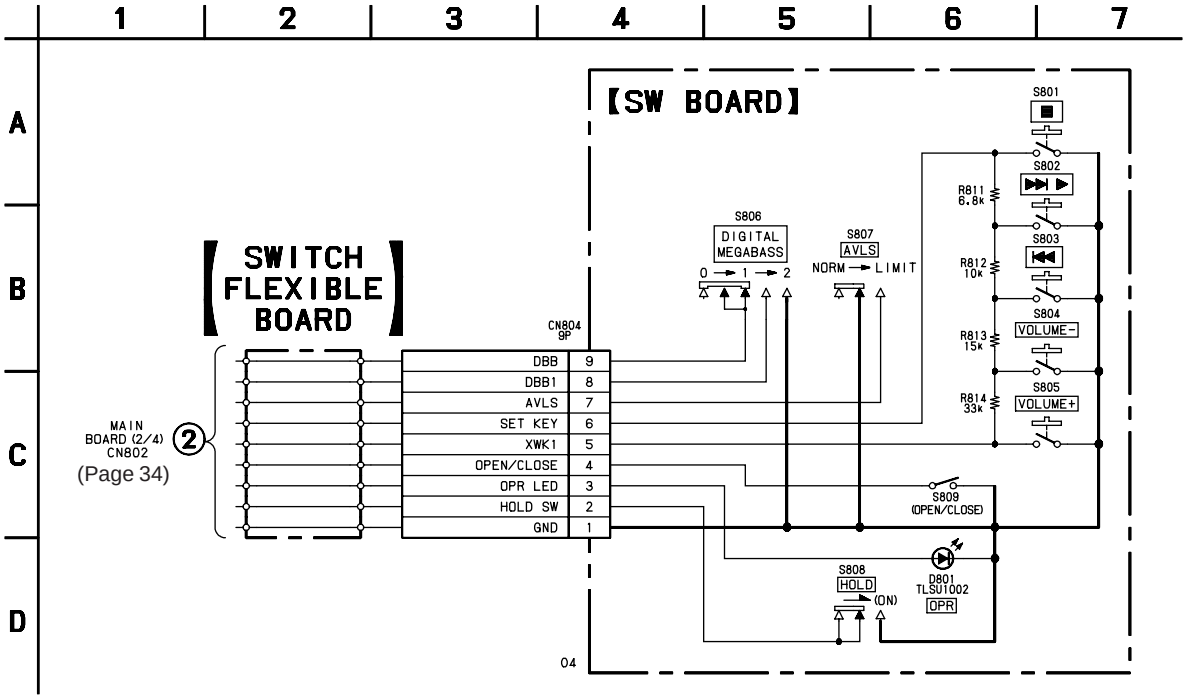


Note:

- ▒▒▒ : Pattern from the side which enables seeing.
  (The other layer's patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

6-3-9. SCHEMATIC DIAGRAM — SW BOARD —

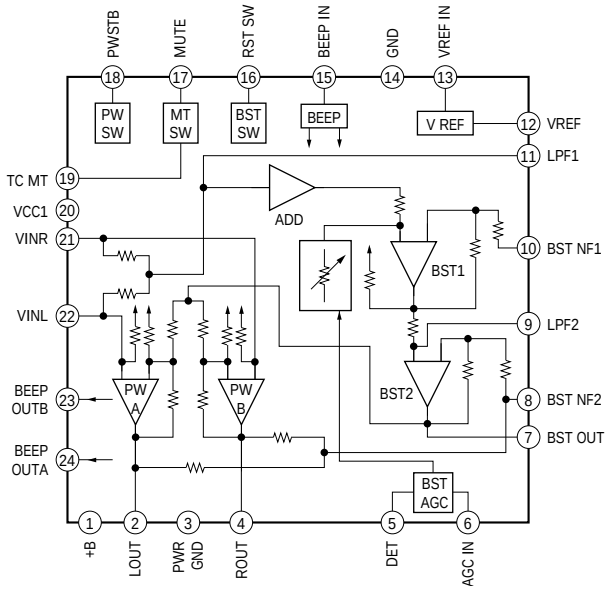


Note:

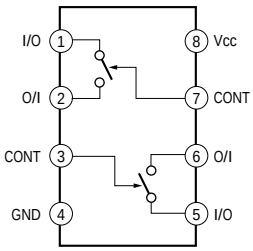
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.
- ▭ : panel designation.

6-4. IC BLOCK DIAGRAM

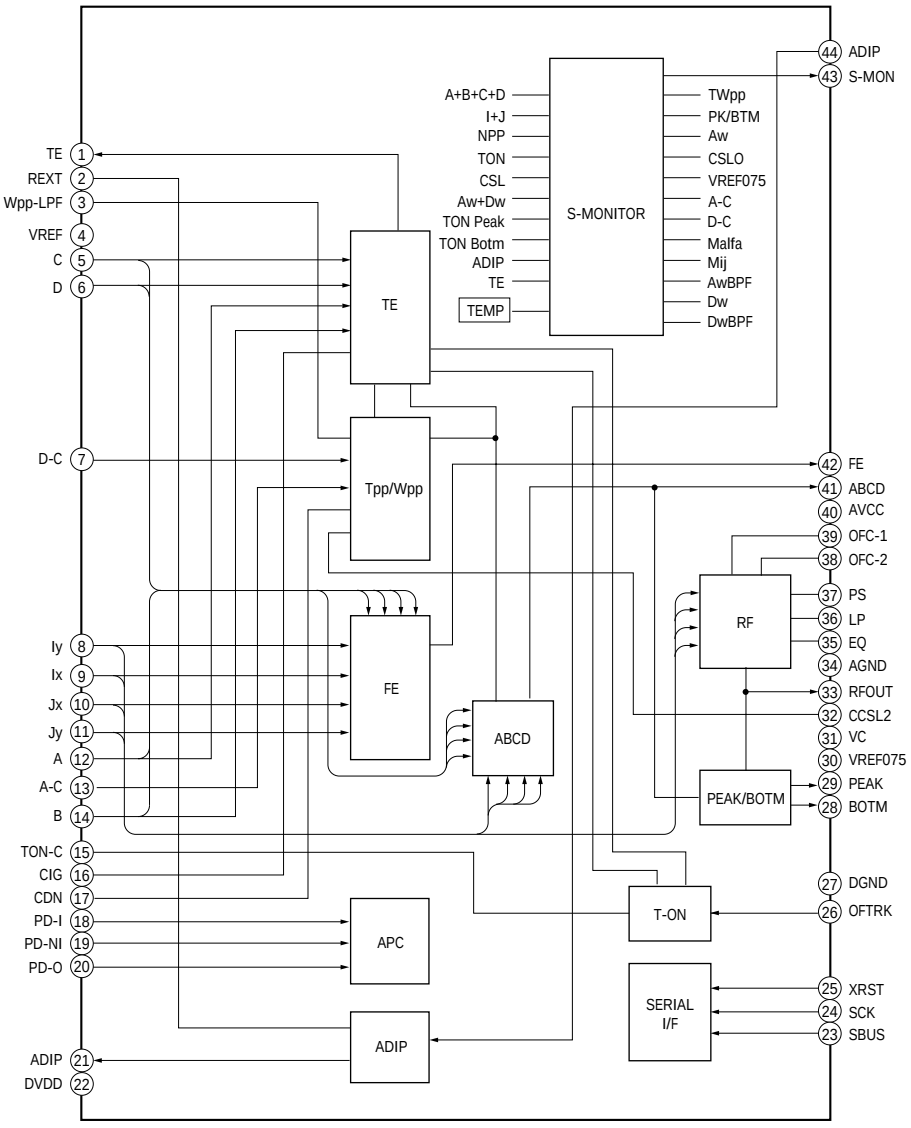
IC301 TA2131FL



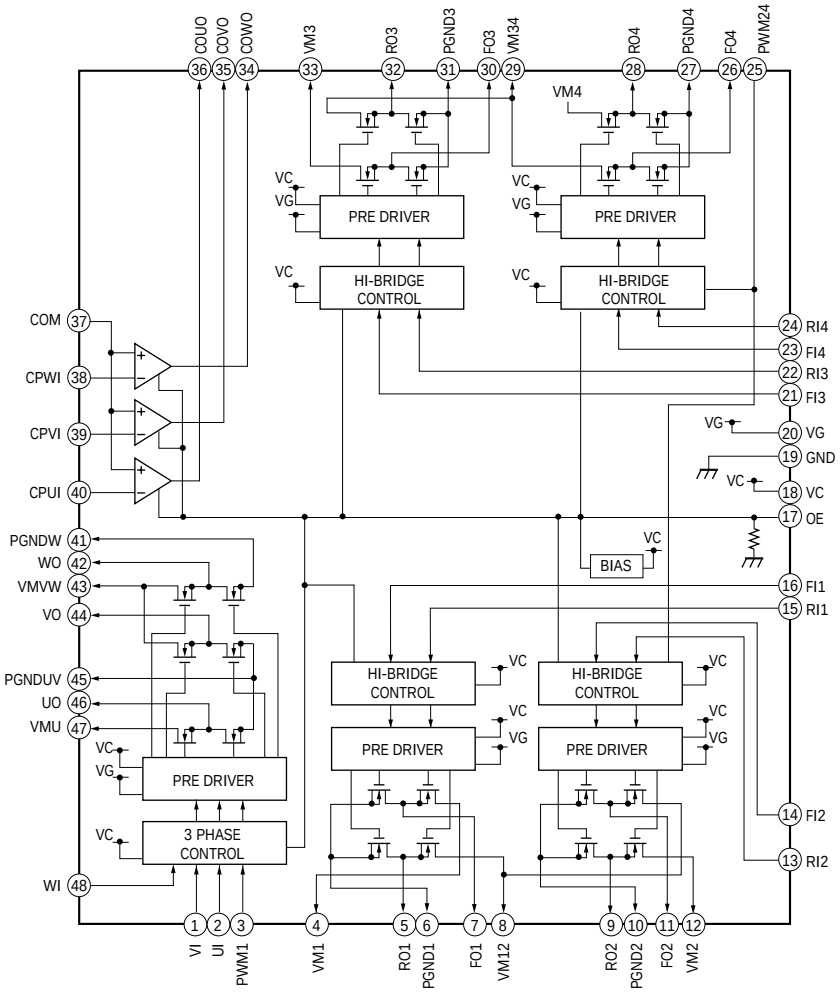
IC504, 505 TC7W66FK



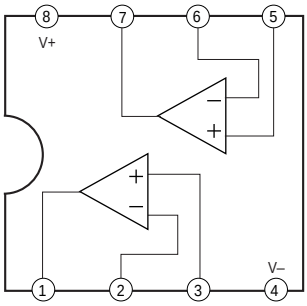
IC501 SN761056DBT



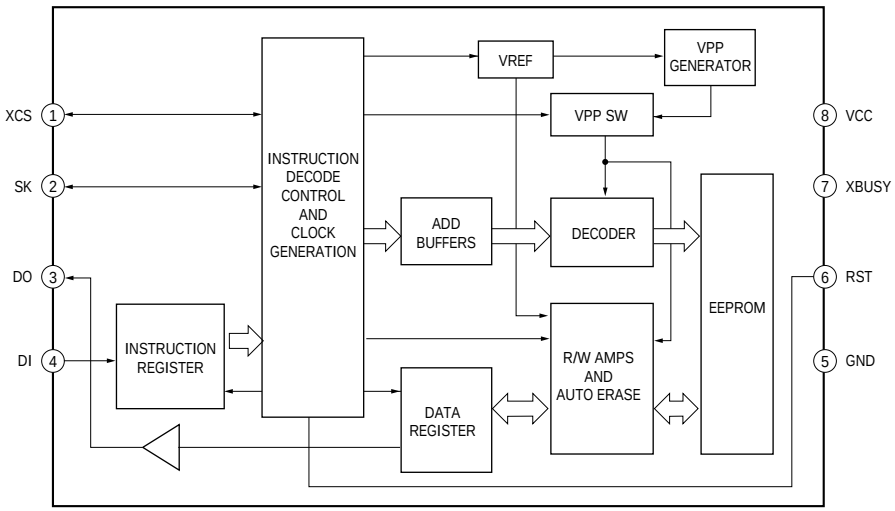
IC551 XC111256FTA



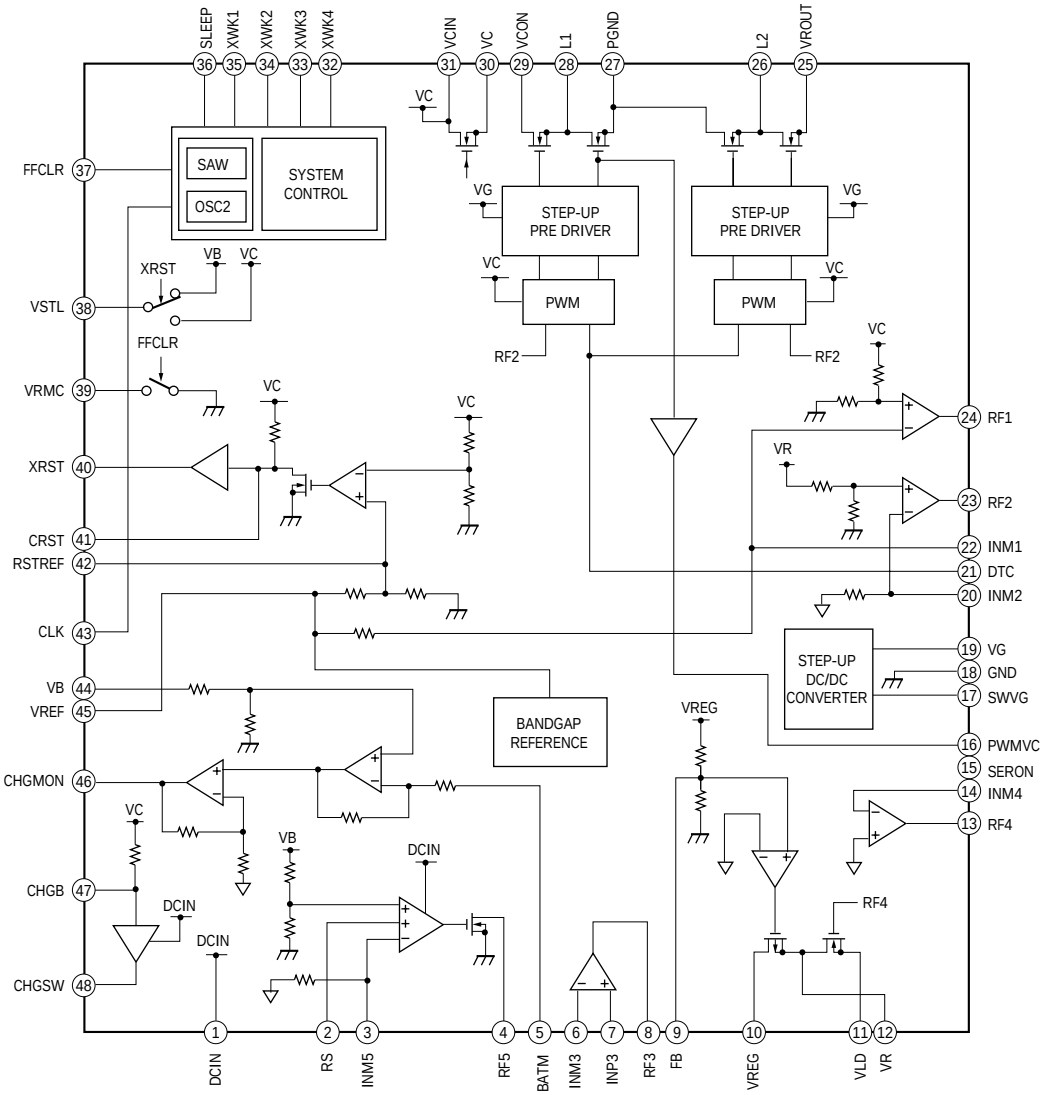
IC552 TLC372CPWR



IC802 AK6480BH-E2



IC901 MPC18A31FTA

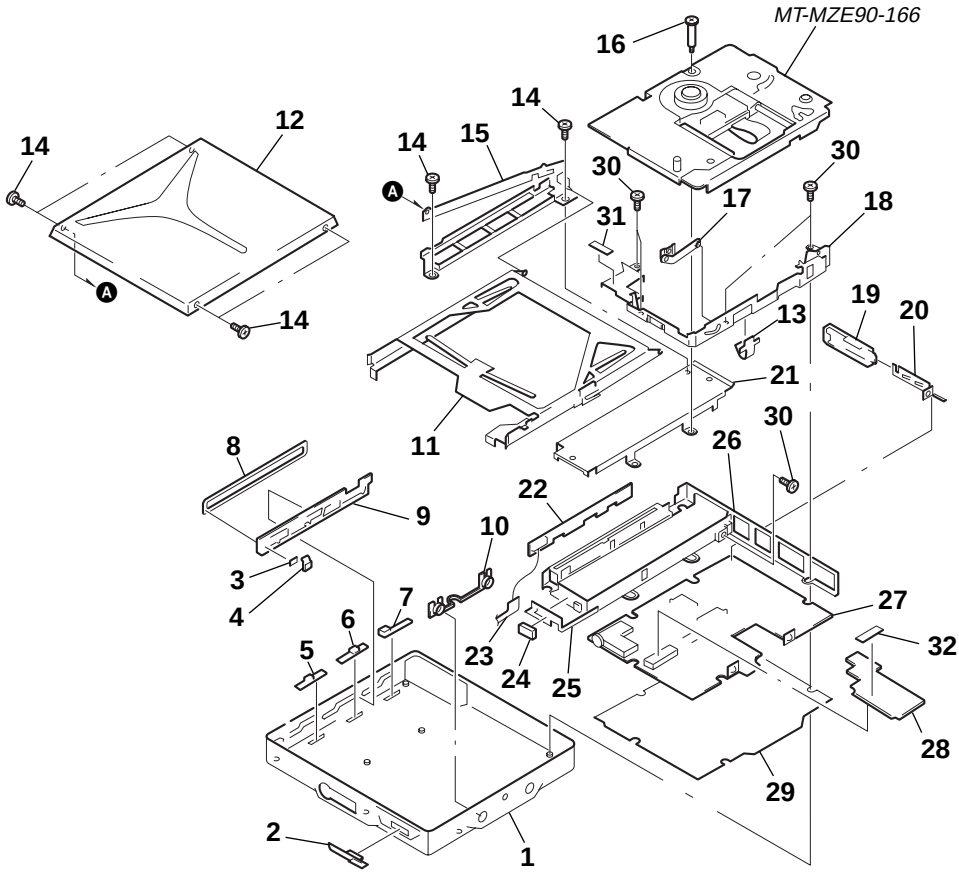


SECTION 7
EXPLODED VIEWS

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ... (RED)
  ↑ Parts Color ↑ Cabinet's Color
- Accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

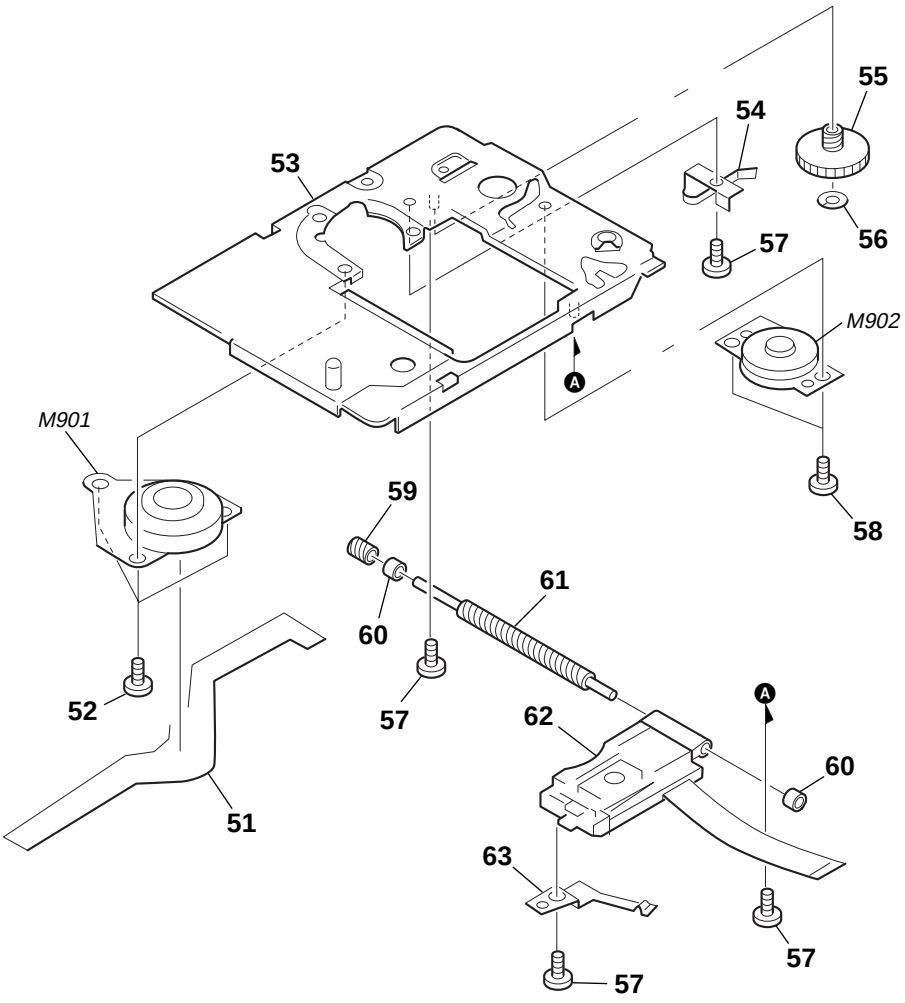
7-1. MAIN UNIT SECTION



Ref. No.	Part No.	Description	Remark
1	4-223-908-01	PANEL, BOTTOM (SILVER)…(SILVER)	
1	4-223-908-11	PANEL, BOTTOM (WHITE)…(WHITE)	
1	4-223-908-21	PANEL, BOTTOM (RED)…(RED)	
2	4-223-915-01	KNOB (OPEN)	
3	4-223-912-01	SHEET (WINDOW LED), ADHESIVE	
4	4-223-911-01	WINDOW (LED)	
5	4-223-925-01	KNOB (HOLD)	
6	4-223-916-01	KNOB (MB)	
7	4-223-917-01	KNOB (AVLS)	
8	4-224-072-01	SHEET (CONTROL BUTTON), ADHESIVE	
9	4-223-910-01	BUTTON, CONTROL	
10	4-212-869-01	ESCUTCHEON	
11	X-4951-947-1	HOLDER ASSY	
12	X-3378-308-1	LID ASSY, UPPER (S) (SILVER)…(SILVER)	
12	X-3378-309-1	LID ASSY, UPPER (W) (WHITE)…(WHITE)	
12	X-3378-310-1	LID ASSY, UPPER (R) (RED)…(RED)	
13	4-214-627-01	SPACER (BATTERY TERMINAL)	
14	4-218-233-05	SCREW (1.7), MI	
15	X-4952-175-1	PLATE (L) ASSY, FULCRUM	
16	4-223-906-01	SCREW, STEP	

Ref. No.	Part No.	Description	Remark
17	X-4952-178-1	BRACKET (STOP) ASSY	
18	X-4952-177-1	PLATE (R) ASSY, FULCRUM	
19	4-223-907-01	LID, BATTERY CASE (SILVER)…(SILVER)	
19	4-223-907-11	LID, BATTERY CASE (WHITE)…(WHITE)	
19	4-223-907-21	LID, BATTERY CASE (RED)…(RED)	
20	X-4952-176-1	TERMINAL ASSY, BATTERY	
* 21	4-223-919-01	COVER (BATT)	
22	A-3322-300-A	SW BOARD, COMPLETE	
23	1-675-336-11	SWITCH FLEXIBLE BOARD	
24	4-214-158-01	DAMPER (–)	
25	4-223-920-01	TERMINAL BOARD (MINUS)	
26	4-223-918-01	CASE, BATTERY (WHITE)…(WHITE/SILVER)	
26	4-223-918-11	CASE, BATTERY (BLACK)…(RED)	
27	A-3323-347-A	MAIN BOARD, COMPLETE	
28	A-3322-302-A	SYSTEM BOARD, COMPLETE	
29	4-223-909-01	INSULATING SHEET	
30	4-963-883-21	SCREW (M1.4), PRECISION PAN	
31	3-044-461-01	SPACER	
32	3-042-755-01	SPACER (SYSTEM PC BOARD)	

7-2. MECHANISM DECK SECTION (MT-MZE90-166)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	1-675-668-11	MOTOR FLEXIBLE BOARD	
52	4-963-883-42	SCREW (M1.4), PRECISION PAN	
53	X-4951-926-1	CHASSIS ASSY	
54	4-222-206-01	SPRING, THRUST	
55	4-222-216-01	GEAR (SA)	
56	3-338-645-31	WASHER (0.8-2.5)	
57	4-963-883-31	SCREW (M1.4), PRECISION PAN	
58	3-349-825-21	SCREW	
59	4-222-208-01	GEAR (SB)	
60	3-043-237-01	BEARING (N)	
61	4-222-203-01	SCREW, LEAD	
⚠62	X-4952-387-1	SERVICE ASSY, OP (LCX-2E)	
63	4-222-205-01	SPRING, RACK	
M901	8-835-666-01	MOTOR, DC SSM-01C14A/C-NP (SPINDLE)	
M902	1-763-399-11	MOTOR, DC (SLED) (WITH PULLEY GEAR)	

SECTION 8
ELECTRICAL PARTS LIST

MAIN

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : µ, for example:
  uA.. : µA.. uPA.. : µPA..
  uPB.. : µPB.. uPC.. : µPC.. uPD.. : µPD..
- CAPACITORS
  uF : µF
- COILS
  uH : µH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

- Abbreviation
  HK : Hong Kong model
  JE : Tourist model

Ref. No.	Part No.	Description			Remark
	A-3323-347-A	MAIN BOARD, COMPLETE			
		**********			
	4-212-901-11	TERMINAL			
		< CAPACITOR >			
C101	1-125-926-11	TANTAL. CHIP	4.7uF	20%	6.3V
C104	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C201	1-125-926-11	TANTAL. CHIP	4.7uF	20%	6.3V
C204	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C351	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C501	1-125-777-11	CERAMIC CHIP	0.1uF	10%	6.3V
C502	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C503	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C504	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C506	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C507	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C508	1-164-938-11	CERAMIC CHIP	0.0015uF	10%	16V
C509	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C510	1-164-845-11	CERAMIC CHIP	5PF	0.25PF	16V
C511	1-164-845-11	CERAMIC CHIP	5PF	0.25PF	16V
C513	1-164-858-11	CERAMIC CHIP	22PF	5%	16V
C515	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C516	1-125-777-11	CERAMIC CHIP	0.1uF	10%	6.3V
C517	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C518	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C519	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C521	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C522	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C524	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C526	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C527	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C529	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C530	1-164-939-11	CERAMIC CHIP	0.0022uF	10%	16V
C551	1-125-777-11	CERAMIC CHIP	0.1uF	10%	6.3V
C552	1-125-777-11	CERAMIC CHIP	0.1uF	10%	6.3V
C553	1-107-765-11	TANTAL. CHIP	3.3uF	20%	16V
C554	1-107-765-11	TANTAL. CHIP	3.3uF	20%	16V
C555	1-135-238-21	TANTAL. CHIP	6.8uF	20%	10V
C556	1-135-238-21	TANTAL. CHIP	6.8uF	20%	10V
C557	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C558	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C559	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C561	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C601	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C603	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C605	1-115-156-11	CERAMIC CHIP	1uF		10V
C606	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C607	1-115-156-11	CERAMIC CHIP	1uF		10V
C608	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C609	1-119-749-11	TANTAL. CHIP	33uF	20%	4V
C610	1-131-862-11	TANTAL. CHIP	47uF	20%	4V
C611	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C612	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C613	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C614	1-127-772-11	CERAMIC CHIP	0.033uF	10%	10V
C615	1-125-777-11	CERAMIC CHIP	0.1uF	10%	6.3V
C616	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C618	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C619	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C851	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C853	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C854	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C855	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C901	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C902	1-107-810-11	TANTAL. CHIP	33uF	20%	4V
C903	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C904	1-119-749-11	TANTAL. CHIP	33uF	20%	4V
C905	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C906	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C907	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C911	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C915	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C916	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C917	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C918	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C951	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C952	1-127-569-11	TANTAL. CHIP	100uF	20%	4V
C953	1-127-569-11	TANTAL. CHIP	100uF	20%	4V
C954	1-164-156-11	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
* CN501	1-778-168-11	CONNECTOR, FFC/FPC (ZIF) 20P			
* CN551	1-793-124-21	CONNECTOR, FPC (ZIP) 8P			
* CN801	1-793-607-21	CONNECTOR, BOARD TO BOARD 50P			
* CN802	1-785-219-22	CONNECTOR, FPC (ZIF) 9P			
		< DIODE >			
D101	8-719-056-72	DIODE UDZ-TE-17-2.4B			
D201	8-719-056-72	DIODE UDZ-TE-17-2.4B			

MAIN

Ref. No.	Part No.	Description			Remark
D351	8-719-017-58	DIODE MA8068			
D601	8-719-421-27	DIODE MA728			
D855	8-719-066-17	DIODE FTZ6.8E-T148			
D901	8-719-066-16	DIODE RB491D-T146			
D902	8-719-066-16	DIODE RB491D-T146			
D903	8-719-420-51	DIODE MA729			
		< FERRITE BEAD >			
FB801	1-414-228-11	FERRITE BEAD INDUCTOR			
FB802	1-414-228-11	FERRITE BEAD INDUCTOR			
		< IC >			
IC501	8-759-641-94	IC SN761056DBT			
IC504	8-759-647-75	IC TC7W66FK(TE85R)			
IC505	8-759-647-75	IC TC7W66FK(TE85R)			
IC551	8-759-660-29	IC XC111256FTA			
IC552	8-759-358-40	IC TLC372CPW-E20			
@ IC601	8-752-400-59	IC CXD2661GA-2			
IC901	8-759-642-13	IC MPC18A31FTA			
		< JACK >			
J301	1-779-867-61	JACK (🎧 REMOTE)			
		< COIL >			
L501	1-469-570-21	INDUCTOR	10uH		
L502	1-469-570-21	INDUCTOR	10uH		
L551	1-414-402-31	INDUCTOR CHIP	47uH		
L552	1-414-402-31	INDUCTOR CHIP	47uH		
L553	1-414-400-41	INDUCTOR	22uH		
L554	1-414-400-41	INDUCTOR	22uH		
L601	1-469-570-21	INDUCTOR	10uH		
L901	1-419-258-21	INDUCTOR	68uH		
L902	1-419-368-21	INDUCTOR	47uH		
L903	1-469-525-91	INDUCTOR	10uH		
L904	1-414-398-11	INDUCTOR	10uH		
L905	1-414-404-41	INDUCTOR	100uH		
		< TRANSISTOR >			
Q501	8-729-922-10	TRANSISTOR 2SA1577-QR			
Q901	8-729-046-48	FET FDV303N			
Q902	8-729-037-53	TRANSISTOR 2SB1462J-QR(TX).SO			
		< RESISTOR >			
R105	1-218-951-11	RES,CHIP	680	5%	1/16W
R205	1-218-951-11	RES,CHIP	680	5%	1/16W
R501	1-218-970-11	RES,CHIP	27K	5%	1/16W
R503	1-216-864-11	METAL CHIP	0	5%	1/16W
R504	1-216-864-11	METAL CHIP	0	5%	1/16W
R505	1-208-691-11	METAL CHIP	2.2K	0.50%	1/16W
R515	1-208-691-11	METAL CHIP	2.2K	0.50%	1/16W
R516	1-208-691-11	METAL CHIP	2.2K	0.50%	1/16W
R517	1-208-691-11	METAL CHIP	2.2K	0.50%	1/16W

Ref. No.	Part No.	Description			Remark
R518	1-218-985-11	RES,CHIP	470K	5%	1/16W
R519	1-218-977-11	RES,CHIP	100K	5%	1/16W
R521	1-218-446-11	METAL CHIP	1	5%	1/16W
R551	1-218-965-11	RES,CHIP	10K	5%	1/16W
R552	1-218-965-11	RES,CHIP	10K	5%	1/16W
R553	1-218-965-11	RES,CHIP	10K	5%	1/16W
R554	1-218-965-11	RES,CHIP	10K	5%	1/16W
R555	1-218-965-11	RES,CHIP	10K	5%	1/16W
R556	1-216-864-11	METAL CHIP	0	5%	1/16W
R601	1-218-929-11	RES,CHIP	10	5%	1/16W
R602	1-218-929-11	RES,CHIP	10	5%	1/16W
R603	1-216-811-11	METAL CHIP	150	5%	1/16W
R604	1-218-973-11	RES,CHIP	47K	5%	1/16W
R605	1-218-965-11	RES,CHIP	10K	5%	1/16W
R606	1-218-977-11	RES,CHIP	100K	5%	1/16W
R607	1-218-987-11	RES,CHIP	680K	5%	1/16W
R608	1-218-977-11	RES,CHIP	100K	5%	1/16W
R609	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R610	1-218-990-11	SHORT	0		
R611	1-218-975-11	RES,CHIP	68K	5%	1/16W
R612	1-218-971-11	RES,CHIP	33K	5%	1/16W
R614	1-218-965-11	RES,CHIP	10K	5%	1/16W
R615	1-218-990-11	SHORT	0		
R619	1-218-990-11	SHORT	0		
R620	1-218-990-11	SHORT	0		
R628	1-218-990-11	SHORT	0		
R630	1-218-965-11	RES,CHIP	10K	5%	1/16W
R809	1-218-973-11	RES,CHIP	47K	5%	1/16W
R816	1-218-957-11	RES,CHIP	2.2K	5%	1/16W
R817	1-218-941-11	RES,CHIP	100	5%	1/16W
R818	1-218-941-11	RES,CHIP	100	5%	1/16W
R819	1-218-989-11	RES,CHIP	1M	5%	1/16W
R820	1-218-990-11	SHORT	0		
R822	1-218-985-11	RES,CHIP	470K	5%	1/16W
R828	1-218-973-11	RES,CHIP	47K	5%	1/16W
R856	1-218-990-11	SHORT	0		
R902	1-218-983-11	RES,CHIP	330K	5%	1/16W
R903	1-218-961-11	RES,CHIP	4.7K	5%	1/16W
R904	1-218-983-11	RES,CHIP	330K	5%	1/16W
R905	1-218-961-11	RES,CHIP	4.7K	5%	1/16W
R907	1-218-990-11	SHORT	0		
R908	1-218-990-11	SHORT	0		
R909	1-218-959-11	RES,CHIP	3.3K	5%	1/16W
R910	1-218-959-11	RES,CHIP	3.3K	5%	1/16W
R918	1-216-855-11	METAL CHIP	680K	5%	1/16W
R920	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R921	1-218-979-11	RES,CHIP	150K	5%	1/16W
R922	1-218-989-11	RES,CHIP	1M	5%	1/16W
R936	1-218-979-11	RES,CHIP	150K	5%	1/16W
R937	1-218-989-11	RES,CHIP	1M	5%	1/16W
R938	1-218-989-11	RES,CHIP	1M	5%	1/16W
R939	1-218-990-11	SHORT	0		
R940	1-218-977-11	RES,CHIP	100K	5%	1/16W

@ Replacement of CXD2661GA-2 (IC601) used in this set requires a special tool. Therefore, it cannot be replaced.

Ref. No.	Part No.	Description			Remark
R941	1-218-967-11	RES,CHIP	15K	5%	1/16W
R942	1-218-963-11	RES,CHIP	6.8K	5%	1/16W
R943	1-218-957-11	RES,CHIP	2.2K	5%	1/16W
R944	1-218-981-11	RES,CHIP	220K	5%	1/16W
		< NETWORK RESISTOR >			
RB551	1-233-965-11	RES, NETWORK (CHIP TYPE)	4.7K		
RB552	1-233-979-11	RES, NETWORK (CHIP TYPE)	1M		
		< VIBRATOR >			
X601	1-781-654-21	VIBRATOR, CERAMIC (22.57MHz)			
**********					
	A-3322-300-A	SW BOARD, COMPLETE			
		**********			
		< CONNECTOR >			
CN804	1-793-606-21	CONNECTOR, FFC/FPC (ZIF) 9P			
		< DIODE >			
D801	8-719-061-82	LED TLSU1002(TPX1.SONY) (OPR)			
		< RESISTOR >			
R811	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R812	1-216-833-11	RES,CHIP	10K	5%	1/16W
R813	1-216-835-11	METAL CHIP	15K	5%	1/16W
R814	1-216-839-11	METAL CHIP	33K	5%	1/16W
		< SWITCH >			
S801	1-771-138-21	SWITCH, KEY BOARD (■)			
S802	1-771-138-21	SWITCH, KEY BOARD (▶▶I ►)			
S803	1-771-138-21	SWITCH, KEY BOARD (I◀◀)			
S804	1-771-138-21	SWITCH, KEY BOARD (VOLUME –)			
S805	1-771-138-21	SWITCH, KEY BOARD (VOLUME +)			
S806	1-692-605-31	SWITCH, SLIDE (DIGITAL MEGABASS)			
S807	1-572-922-11	SWITCH, SLIDE (AVLS)			
S808	1-572-922-11	SWITCH, SLIDE (HOLD)			
S809	1-771-483-61	SWITCH, PUSH (1 KEY) (OPEN/CLOSE)			
**********					
	A-3322-302-A	SYSTEM BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C102	1-125-899-11	TANTAL. CHIP	220uF	20%	4V
C103	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C202	1-125-899-11	TANTAL. CHIP	220uF	20%	4V
C203	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C301	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C302	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C303	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C304	1-125-926-11	TANTAL. CHIP	4.7uF	20%	6.3V
C305	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C306	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C802	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C803	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C804	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C806	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C807	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C808	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C809	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C811	1-107-820-11	CERAMIC CHIP	0.1uF		16V
		< CONNECTOR >			
* CN803	1-793-608-21	CONNECTOR, BOARD TO BOARD 50P			
		< IC >			
IC301	8-759-598-15	IC TA2131FL-EL			
@ IC801	8-752-912-55	IC CXR701080-006GA			
IC802	8-759-566-18	IC AK6480BH-E2			
		< TRANSISTOR >			
Q301	8-729-037-52	TRANSISTOR 2SD2216J-QR(TX).SO			
		< RESISTOR >			
R101	1-218-967-11	RES,CHIP	15K	5%	1/16W
R102	1-218-961-11	RES,CHIP	4.7K	5%	1/16W
R103	1-218-961-11	RES,CHIP	4.7K	5%	1/16W
R104	1-218-929-11	RES,CHIP	10	5%	1/16W
R201	1-218-967-11	RES,CHIP	15K	5%	1/16W
R202	1-218-961-11	RES,CHIP	4.7K	5%	1/16W
R203	1-218-961-11	RES,CHIP	4.7K	5%	1/16W
R204	1-218-929-11	RES,CHIP	10	5%	1/16W
R301	1-218-935-11	RES,CHIP	33	5%	1/16W
R302	1-218-963-11	RES,CHIP	6.8K	5%	1/16W
R303	1-218-981-11	RES,CHIP	220K	5%	1/16W
R801	1-208-943-11	METAL CHIP	220K	0.50%	1/16W
R802	1-208-943-11	METAL CHIP	220K	0.50%	1/16W
R803	1-218-985-11	RES,CHIP	470K	5%	1/16W
R804	1-218-973-11	RES,CHIP	47K	5%	1/16W
R806	1-218-977-11	RES,CHIP	100K	5%	1/16W
R807	1-218-959-11	RES,CHIP	3.3K	5%	1/16W
R808	1-218-959-11	RES,CHIP	3.3K	5%	1/16W
R810	1-218-973-11	RES,CHIP	47K	5%	1/16W
R815	1-218-941-11	RES,CHIP	100	5%	1/16W
R823	1-216-295-00	CONNECTOR,CHIP (2012)			
R826	1-216-864-11	METAL CHIP	0	5%	1/16W
R827	1-218-989-11	RES,CHIP	1M	5%	1/16W
		< VIBRATOR >			
X801	1-781-575-11	VIBRATOR, CERAMIC (16.9344MHz)			
**********					

@ Replacement of CXD2661GA-2 (IC601) used in this set requires a special tool. Therefore, it cannot be replaced.

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		**********	
23	1-675-336-11	SWITCH FLEXIBLE BOARD	
51	1-675-668-11	MOTOR FLEXIBLE BOARD	
M901	8-835-666-01	MOTOR, DC SSM-01C14A/C-NP (SPINDLE)	
M902	1-763-399-11	MOTOR, DC (SLED) (WITH PULLEY GEAR)	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-418-493-51	REMOTE CONTROL UNIT (RM-MZ25) (SILVER)…(SILVER)	
	1-418-493-61	REMOTE CONTROL UNIT (RM-MZ25) (CLEAR)…(WHITE,RED) (HK)	
⚠	1-528-580-21	BATTERY CHARGER (BC-7HT) (JE)	
⚠	1-528-866-11	BATTERY CHARGER (BC-9HP2) (HK)	
	1-528-918-11	BATTERY CASE	
⚠	1-569-007-11	ADAPTOR, CONVERSION 2P (JE)	
	1-756-036-11	BATTERY, NICKEL HYDROGEN (NH-14WM)	
	3-043-060-01	CASE, CHARGE (C/D)	
	3-868-188-11	MANUAL, INSTRUCTION (SPANISH,TRADITIONAL CHINESE)	
	3-868-188-21	MANUAL, INSTRUCTION (ENGLISH,FRENCH)	
	3-868-188-71	MANUAL, INSTRUCTION (JAPANESE,KOREAN) (JE)	
	4-221-117-01	CASE, CARRYING	
	8-953-304-90	RECEIVER MDR-E805SP	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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